Nov.
1931

AMERICAN GAS ASSOCIATION MONTHLY

Gas Industry's Stability Shown at Convention

A United Industry Is Ready
CLIFFORD E. PAIGE

Developments in Natural Gas Field
H. O. CASTER

A. G. A. Prepares For Enlarged Public Service
ALEXANDER FORWARD

Golden Rule Is Today's Business Need
SIR FRANCIS GOODENOUGH, C.B.E.

204 Manufacturers Attend Annual Meeting in Detroit

AMERICAN GAS ASSOCIATION · LIGHT · HEAT · POWER · INCORPORATED · 1919

The Public Is Hearing About It

BY ETHEL A. CONKLIN

THE A. G. A. Course is getting results because it tends to develop the thoughts of the individual employees and encourages free discussion of their own contact problems.

¶ We have striven at all times to give our customers, the public, the finest type of service that could be rendered. Today, that service has been augmented by a thinking and understanding clerk, a clerk who is not content with accepting an order and passing it on, but who is ever anxious to see that the customer receives all the information and attention essential to the proper handling of the order, and good service.

¶ Our company's enrollment in this Course has more than doubled the number of enrollments by social and home contacts. It is most natural to discuss with our families and friends the things we are most interested in, and by doing that we are carrying this educational program to thousands of persons who are not employees. These people, in turn, tell us of their contact problems and the methods used by utilities and other concerns.

¶ I have seen many steps of progress made by our company in the rendering of courteous, prompt and efficient service, but this Course is the keynote of them all.

MISS CONKLIN IS ONE OF SEVEN THOUSAND EMPLOYEES ENROLLED IN THE A. G. A. COURSE IN EMPLOYEE-CUSTOMER RELATIONS.

AMERICAN GAS ASSOCIATION MONTHLY

Allyn B. Tunis, Editor

Advisory Committee

FRANK LEROY BLANCHARD · E. FRANK GARDINER · HOWARD F. WEEKS
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The Association does not hold itself responsible for statements and opinions contained in papers and discussions appearing herein.

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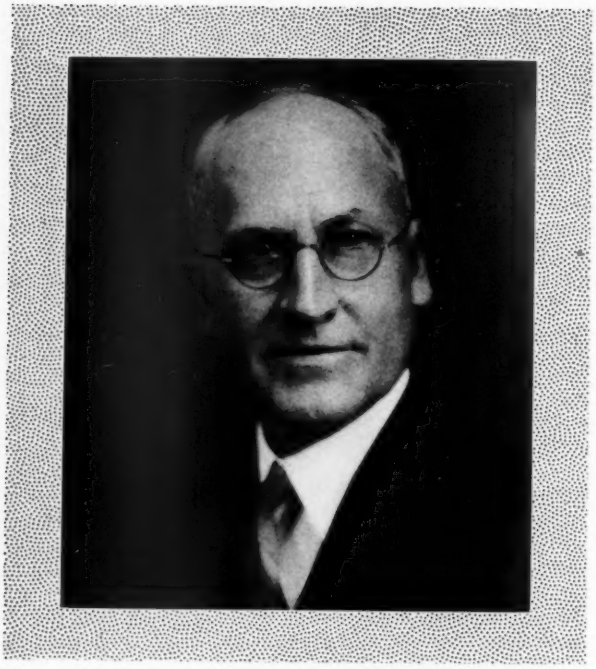

Geo. W. Parker

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OUR OWN WHO'S WHO

GEORGE W. PARKER, president and general manager of the Parker-Russell Mining & Manufacturing Co., St. Louis, Mo., has been an active member of the American Gas Association for a long while having served as chairman of the Membership Committee, Chairman of the Manufacturers Section and completed two terms as a director, besides serving on the Advisory Council. Mr. Parker, a native of St. Louis, received his education in that city, and before entering Washington University, served a year as a templet maker in an iron works. In 1900, he entered the employ of the Parker-Russell Company as a draftsman, and three years later was transferred to the New York office of that company, where he remained for seven years, principally occupied with designing, selling, building and operating coal gas benches. After serving as vice-president and general manager of the Russell Engineering Company, he returned in a similar executive capacity to Parker-Russell, and, in 1924, was elected president. Mr. Parker has centered much of his interest in new developments in connection with the manufacturing of gas. In 1912, he developed and patented a process for supporting sectional Silica gas retorts, and also is responsible for introducing several other improvements for the betterment of gas apparatus. Mr. Parker, who is a prominent member of the St. Louis Rotary Club, is fond of farming and salt-water sailing, when he is not engaged in developing new ideas for the benefit of his industry.

AMERICAN
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MONTHLY

VOLUME XIII NOVEMBER, 1931 NUMBER 11

Gas Industry's Stability Shown at Convention

WITH the close of the final session of the Thirteenth Annual Convention of the American Gas Association, 5,000 members returned to their homes convinced that they were part of an industry that had demonstrated its stability and progressiveness, even while passing through a difficult period. Both in the manufactured and natural gas fields, the industry has been able to maintain the soundness of its securities, avoid unemployment evils and today, as an essential industry, faces the future with confidence.

Many viewed the large attendance of members as an indication of their earnestness in striving to further their usefulness in rendering yet better service to the public. It was a serious-minded convention, all intent upon studying individual problems at close range.

This was particularly emphasized among the thousands of executives who carefully inspected the appliances, equipment and apparatus assembled in the Atlantic City Auditorium in what was described as not only the largest but the most complete exhibit of its kind. Many manufacturers who participated in this exhibition declared that more satisfactory results had resulted from their displays than at any similar show.

At general sessions, sectional and departmental meetings, there was manifest an earnestness for information that clearly showed how sincere those present were in seeking out new facts for the strengthening of their business and improving their knowledge for the betterment of service to their customers.

Final registration figures showed that exactly 5,012 members and guests attended the convention and exhibition. This figure, while not as large as that of 1930, was particularly gratifying to the Association.

The convention and exhibition opened in the Auditorium on October 12, but did not get into full swing until the following day when the first general session was held in the big ballroom. At this time there were present several visitors from abroad. Among those who were introduced by Clifford E. Paige, president of the Association, were Sir Francis Goodenough, C. B. E., London, England, executive chairman of the British Commercial Gas Association; J. Herbert Canning, O. B. E., Newport, Monmouthshire, president of the Institution of Gas Engineers, and Hideo Morioka, chief engineer of the Nishi Works, Kobe Gas Company, Kobe, Japan.

There was a blaze of enthusiasm in the big ball room of the Atlantic City Auditorium, where the General Sessions took place, when Sir Francis was introduced. As the Englishman approached the rostrum an organ burst forth with "God Save the King," followed by the "Star Spangled Banner." Sir Francis was deeply touched by the demonstration, which brought the

5,000 A. G. A. Members at Atlantic City Impressed With Progressive Spirit

New Officers

ASSOCIATION officers to serve for the ensuing year were elected at the convention as follows:

President—R. W. Gallagher, president of the East Ohio Gas Company, Cleveland, Ohio.

Vice-president—Arthur Hewitt, vice-president and general manager, Consumers Gas Co., Toronto, Canada.

Vice-president—N. C. McGowen, vice-president, United Gas Public Service Company, Houston, Texas.

Vice-president—Howard Bruce, chairman of board, Bartlett-Hayward Company, Baltimore, Md.

Treasurer—William J. Welsh, vice-president and general manager, New York & Richmond Gas Company, Staten Island, N. Y.

Directors, two-year terms—

F. S. Wade, president, Southern Counties Gas Company, Los Angeles, Calif.; B. J. Mullaney, vice-president, The Peoples Gas Light & Coke Company, Chicago, Ill.; H. C. Abell, vice-president, Electric Bond & Share Company, New York, N. Y.; P. S. Young, vice-president, Public Service Elec. & Gas Company, Newark, N. J.; H. Russell, president, Rochester Gas & Electric Corp., Rochester, N. Y.; C. N. Lauer, president, Philadelphia Gas Works Co., Philadelphia, Pa.; F. C. Freeman, president, Providence Gas Co., Providence, R. I.; F. A. Miller, Chairman of Board, S. R. Dresser Mfg. Co., Bradford, Pa.; J. S. DeHart, Jr., president, Isbell-Porter Co., Newark, N. J.

R. W. Gallagher
President

members to their feet. When the applause had subsided and the distinguished visitor had partly recovered from the impressive reception, he said:

"I am sure that I have the sympathy of you all, because it is very difficult to speak without any excess of emotion after such a reception as you have given me, and after such an impression as my good friend Paige has seen fit to make—a most embarrassing impression for me, I can assure you."

Mr. Canning was one of the speakers before the Technical Section, giving an outline of the British Gas Industry.

In the president's annual message, Mr. Paige told the members that the industry has shown less decline than almost any other business, which fact he attributed to careful preparation under the Five-Year Plan, and in view of the success of that program the convention approved a second Five-Year Plan of Association activities. Dana B. Barnum, president of the Boston Consolidated Gas Company, Boston, Mass., as chairman of the Committee on Association Activities, briefly outlined the work of the future, and it received hearty endorsement.

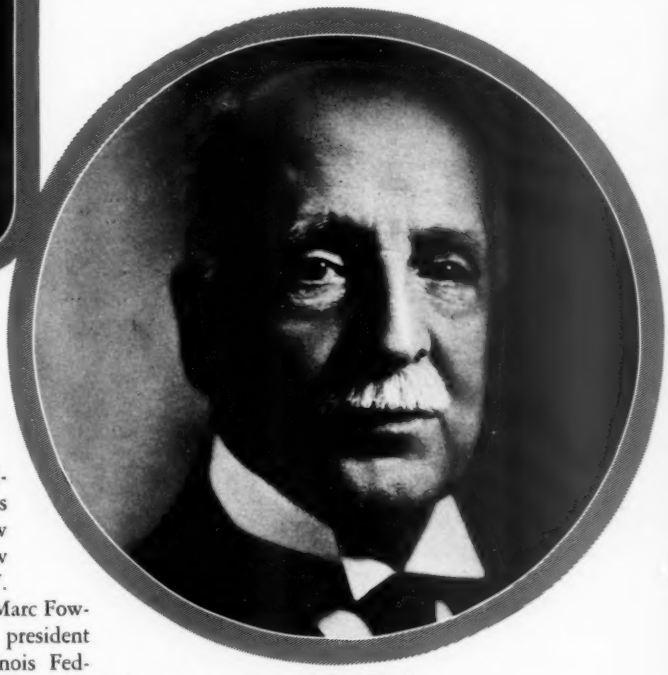
Morse DellPlain, president of the Consolidated Gas Co. of New York, New York, N. Y.

Mrs. J. Marc Fowler, former president of the Illinois Federation of Women's Clubs, gave some valuable ideas on how gas companies could assist in making better homes in this country.

Some of the other outstanding papers before the general sessions included those by Dr. Zay Jefferies, consulting metallurgist, Aluminum Corporation of America, Cleveland, Ohio; Judge H. O. Caster, general counsel, Henry L. Doherty & Company, New York, N. Y., who talked on "Developments in the Natural Gas Field," and B. C. Forbes, editor, *Forbes Magazine*, New York, N. Y.

Entertainment features of the convention proved particularly attractive and a portion of the concert, including a brief address by President Paige, was broadcast over a nation-wide chain of the National Broadcasting Company, through the courtesy of Halsey, Stuart and Company.

Those who took part in the entertainment program included such outstanding artists as Miss Hallie Stiles, soprano; members of the celebrated Mendelssohn Glee Club, of New York, under Ralph L. Baldwin as conductor; Lew White, organist and Phil Spitalny with his dance orchestra. The South Sea Islanders and Spitalny's orchestra were featured at an "Hawaiian Dance."



Arthur Hewitt
Vice-President

T. V. Purcell, vice-president, The Peoples Gas Light & Coke Co., Chicago, Ill., received the Charles A.

Industry Maintains Its Stability

THE American Gas Association again finds cause for gratification at the stability and adaptability of the gas industry of the United States and Canada, maintaining through a difficult period its service to the public, the soundness of its securities, the relative absence of unemployment, and expresses confidence in its future as an essential American industry.

Munroe award for pioneering and constructive leadership in rate making, for focusing attention on sales development and crystallizing the gas industry's economic policies to this end.

In recognition of the best paper on a technical subject given at the 1930 convention, Philip T. Dashiell, engineer of works, Philadelphia Gas Works Co., Philadelphia, Pa., was awarded the Beal Medal.

A posthumous award of the A. G. A. Meritorious Service Medal went to Frank E. Steinhardt, a foreman employed by the Consolidated Gas Company of New York.

N. C. McGowen
Vice-President

Unusual interest was aroused by the departmental, sectional and group meetings. With the opening of the convention on Monday, the principal meetings were those of the Natural Gas Department, and the Publicity & Advertising Section.

Four meetings were held by the Accounting Section during the convention. Two meetings of the Commercial Section took place, while the Technical Section also was occupied with two important gatherings.

The Manufacturers' Section met briefly to comply with the requirements of the By-Laws of the Association to elect officers reported at the annual meeting which was held in Detroit in September.

The Industrial Gas Section held a busy meeting Wednesday.

The Home Service Luncheon was a feature of interest to women in attendance and they also were attracted to an interesting round table discussion. In addition, special entertainment features had been arranged for them and they enjoyed a card party at the Seaview Golf Club.

Miss Karen Fladoes, chairman of the Home Service Committee presided at the Round Table discussion on Monday afternoon. G. W. Ousler, sales manager of the Equitable Gas Company, discussed "Home Calls" from a sales manager's viewpoint. He stated that a well-informed home service staff could do much to combat criticism and agitation against utilities and called attention to the fact that a Home Service girl was the representative of the utility company in the homes of the customer.

Miss Hulda Ungericht, Columbus Gas and Fuel Company, Columbus, Ohio, reported the procedure and business of home calls as carried out in many companies. Miss Ungericht, as chairman of the committee which prepared the Home Service Home Call book, stressed the necessity for cooperation of Home Service workers with the other departments of the company, in order to give the maximum of united customer service.

Alexander Forward extended brief greetings to the group, expressing the recognition of Home Service as an integral activity of the gas association. He introduced Sir Francis Goodenough who brought out that he had studied Home Service work in the United States and had carried over the same idea in England. He felt that Home Service work was a wise expenditure even in these times of economy.

Mrs. Joseph B. C. Wakeley, of the New Jersey State Federation of Women's Clubs in Newark, spoke of the value received by homemakers from home service departments in the many methods learned through the correct use of their appliances, to give homemakers more time for leisure and other activities.

Howard Bruce
Vice-President

Meet Again Next Year In Atlantic City

AFTER the fullest consideration of the entire situation, the Committee on Time and Place unanimously recommended that the Fourteenth Annual Meeting of the Association be held in Atlantic City during the week of October 10, 1932, which recommendation was adopted by the Convention.

William J. Welsh
Treasurer

Five-Year Program Meets Approval

BELIEVING that the Five-Year Program of Association activities, adopted in 1926, has guided the industry well and served to concentrate our energies in the directions most essential to our progress, the American Gas Association, in convention assembled, heartily approves the new program prepared by the Executive Board for the succeeding five-year period.

Kitchen planning—a new home service project has been closely tied up with a survey conducted among a large group of homemakers by Delineator Institute of New York. Miss Grace Pennock, director of this survey, reviewed many of their results and outlined the experiment being carried on by their institute to give assistance in this work. Miss Dorothy Shank of the American Stove Company, Cleveland, and chairman of the Kitchen Planning Committee, outlined the plan of work decided on by the committee as the most useful to gas companies and most appreciated by the customers desiring assistance. A full report of this committee's work is contained in the 1931 Home Service Report.

Miss Jane Callaghan, Brooklyn Borough Gas Company, Coney Island, N. Y., described the "Kitchen Practical" designed by Dr. Lillian Gilbreth and stated that her company is continuing the planning work by studying the heights and sizes of work spaces.

Home Service Luncheon

Seventy-five were in attendance at the Home Service luncheon meeting, held at the Shelburne Hotel, Tuesday noon with Jessie McQueen, home service counsellor, presiding. E. R. Acker, chairman of the Commercial Section, gave a talk on his impressions of home service work. Mr. Acker definitely feels that home service must be a commercial feature in a gas company to aid in evolving a complete service for the customer. The home service women must first of all be business women—fully trained to teach the customer how to make full and profitable the use of gas service.

Mrs. Fowler

Mrs. J. Marc Fowler, former president of the Illinois Federation of Women's Clubs, and a member of the National Council, General Federation Women's Clubs, Chicago, Ill., was one of the speakers at the general session on October 14. She delivered an interesting address on "The Gas Company and the Better Home."

Miss Fladoes outlined the trends in home service and plans for its future development. Aims for home service should work toward a broader knowledge of the gas industry—toward a plan of work which will make gas fit more completely into all phases of homemaking; increased attention to all pieces of equipment; closer cooperation with manufacturers; and preparedness for keen competition, particularly stressing information on the cleanliness and safety in the use of gas in the home.

Home service ideas—a group of

Vote of Confidence for Manufacturers

OUR exhibitors at the Thirteenth Annual Convention of the Association have given the industry a vote of confidence, and have demonstrated their ability and purpose to produce and develop appliances and equipment for public use unsurpassed anywhere in efficiency or beauty, and the Association hereby expresses its appreciation of their achievements and its confidence in our manufacturers.

The Association especially recognizes what our manufacturers have done by putting on the most comprehensive and most attractive exhibition ever seen anywhere.

It is indeed refreshing to see, in these trying times, such a manifestation of the courage our associates have shown.

American Gas Association Exhibit at Atlantic City Convention.

Mr. Paige Addresses Radio Audience

Friends of the Radio Audience:

AN Association, representing an industry whose services are intimately connected with the daily life of every citizen, is now in session at Atlantic City. It is my pleasure to speak to you for a moment as President of the American Gas Association.

This Association is organized to continually improve the service that it renders to its customers and to make available to an increasing number of its patrons the newer uses for gas. More than 4500 men and women, representing the manufactured and natural gas industries of the United States and Canada are here assembled to discuss the problems of the gas business, in order to promote and develop to the fullest extent, the usefulness of this industry to the public.

Under an aggressive, practical sales policy the industry has made notable advances in the field of domestic gas sales, particularly in househeating and refrigeration.

Increased investments, aggregating many millions of dollars, in plant improvements and extensions, the unprecedented progress and widened development of natural gas along economic lines, have been made despite the retarded activity of industry and business in general, to meet the growing demand for gas fuel.

Definite and practical steps have been taken in the direction of a fuller degree of cooperation between the industry and all those in any way interested in the manufacture and sale of gas-using equipment looking to the day not far distant when the principles and practice of this program of trade cooperation will be reflected in a maximum of public service and reasonable profit to both the trade and the utility industries.

Constructive progress has been made, through cooperative research, in the development of additional uses for gas, all of which will react in increased revenues to the industry with the resumption of normal industrial activity, as well as the interesting progress made in the application of gas to the important problem of house cooling and air conditioning.

This constructive record of accomplishment has been carried forward under the leadership of the American Gas Association, which operates under a carefully developed program of which the first five-year period has been successfully completed, and we are already launched upon a second five-year period of service to the country. I thank you.

short talks—were lead by Mrs. Anna J. Peterson, The Peoples Gas Light and Coke Company, Chicago. Mrs. Peterson listed a variety of the activities conducted in her department to increase the scope of home service activities.

Four other Home Service women were called on in the brief time left for discussion. Miss Jessie Read, Consumers Gas Company, Toronto, developed the study made of interdepartment relations, why it is necessary for successful home service work and how it may be achieved; Mrs. Cecil Harvey, Westchester Lighting Company, Mt. Vernon, N. Y., outlined the program of Girl Scout cooperation in her territory; Miss Mary Keenan, Niagara Hudson Power Corporation at Syracuse, stressed their endeavor to assist in trade-dealer cooperation, their plan of work and its success; Miss Ada Bessie Swann, Public Service Electric & Gas Co., Newark, N. J., closed the talks with advice as to the points to be kept in mind with the formation of new Home Service Departments—cooperation between departments and loyalty to the organization.

Laboratory Fees Reduced 10 Percent

THE Managing Committee of the A. G. A. Testing Laboratory announced at the Convention that a discount of 10 percent in all appliance testing and inspection fees would be effective during the Association year 1931-1932.

Utility Men Aid Chicago Relief Work

B. J. MULLANEY, vice-president of The Peoples Gas, Light & Coke Company, Chicago, and former president of the American Gas Association has been appointed a member of the publicity and advertising division of the Cook County Joint Emergency Relief Campaign for the benefit of the unemployed in Chicago and vicinity. E. Frank Gardiner, of The Midland United Company, has been placed in charge of newspaper relations.

Canadian Gas Association

AT a meeting of the executive committee held in Atlantic City on October 14, Winnipeg, Manitoba, was selected as the place and June 6 and 7 as the time for the 1932 convention of the Canadian Gas Association. Fort Garry Hotel will be official headquarters.

Departmental and Sectional Officers

Officers were elected by departments and sections at the thirteenth annual convention as follows:

Natural Gas Department—T. J. Strickler, Kansas City Gas Company, Kansas City, Mo., chairman; L. K. Langdon, Union Gas and Electric Company, Cincinnati, Ohio., vice-chairman.

Accounting Section—William A. Doering, Boston Consolidated Gas Company, Boston, Mass., chairman; J. M. Roberts, The Peoples Gas Light & Coke Company, Chicago, vice-chairman.

Commercial Section—Samuel Insull, Jr., Midland United Company, Chicago, Ill., chairman; Walter C. Beckjord, Boston Consolidated Gas Company, Boston, Mass., vice-chairman.

Industrial Gas Section—A. J. Peters, Consolidated Gas Company of New York, New York, N. Y., chairman; W. F. Miller, Public Service Company of Northern Illinois, Chicago, Ill., vice-chairman.

Manufacturers' Section—D. F. Kahn, Estate Stove Company, Hamilton, Ohio, chairman; D. B. Stokes, United States Pipe & Foundry Co., Burlington, N. J., and Robert M. Leach, Glenwood Range Company, Taunton, Mass., vice-chairmen.

Publicity and Advertising Section—William H. Hodge, Byllesby Engineering and Management Corp., chairman; Henry Obermeyer, Consolidated Gas Company of New York, New York, N. Y., vice-chairman.

Technical Section—I. K. Peck, Midland United Company, Chicago, Ill., chairman; J. A. Perry, United Gas Improvement Company, Philadelphia, Pa., vice-chairman.

New Directors and Chairmen

F. S. Wade
Director

B. J. Mullaney
Director

H. C. Abell
Director

P. S. Young
Director

Herman Russell
Director

C. N. Lauer
Director

F. C. Freeman
Director

F. A. Miller
Director

J. S. DeHart, Jr.
Director

T. J. Strickler
Chairman
Natural Gas Dept.

Wm. A. Doering
Chairman
Accounting Section

Samuel Insull, Jr.
Chairman
Commercial Section

A. J. Peters
Chairman
Industrial Section

D. F. Kahn
Chairman
Manufacturers' Sect.

Wm. H. Hodge
Chairman
Pub. and Adv. Sect.

I. K. Peck
Chairman
Technical Section

A United Industry Is Ready

President's Address at Annual Convention*

By Clifford E. Paige

C. E. Paige

THIS is a year when the President should speak intimately with respect to the affairs and activities of the Association. This is a year when the gas industry, entering upon its second five year term of planned service, carried out a resolute policy of self searching and concentration of effort. The opportunity is afforded to the President to be in close touch with the affairs of the Association through the reports of the committees and conferences, and by reason of his attendance at the meetings of the Executive Board. This past year has been an exceptional one because of this period of self examination, with substantial modifications in policy as a result. The Managing Director, in his report, will give, for your consideration, an outline of the important and impressive statistics of the industry.

These statistics clearly establish ours as an essential industry. We can safely assert that the growth and progress of the gas business in America has, in no small degree, been dependent on the American Gas Association, through the cooperative efforts of its members. Its purposes, projects and activities, resulting in the development of its usefulness to the gas industry, have been conducted in accordance with the declarations of a "Five-Year Program," inaugurated in 1926 and prepared by able leaders of this industry. Many of you now appreciate the completeness with which this plan so wisely provided for the effective and successful advancement of our business. The industry will always be indebted to the outstanding work of the Hon. George B. Cortelyou and his associates on the special committee that prepared such comprehensive principles of guidance for the development of Association work.

Your Executive Board, convinced that these principles have stood for the last five years every possible test and impressed with the satisfactory operation of this method of charting a way, created in January of 1931 a special committee with Mr. D. D. Barnum as Chairman, to formulate and present a program of Association activities for the next five years. After very thorough and careful review of the past and present activities of the Association, which necessitated many meetings and extensive discussions, this Committee on Association Activities submitted its report and recommendations to the Board. The program was unanimously adopted by the Executive Board, last May.

The Committee presented a supplemental report, recommending changes necessary to perfect the coordination of the work of the Association, to improve the general efficiency and economy of operation. This report further proposed methods of control of all activities to facilitate closer supervision by the Executive Board.

Pursuant to the recommendations, a Control Committee was appointed. This Committee has reviewed all the proposed work of the Sections for the next Association year, approved those activities that appear most important, eliminated and postponed others, reduced the size and number of committees, eliminated certain mid-year conferences, and suggested adjustments of committee work, so that member companies may save substantially in traveling expenses and in the time of their people who serve on committees. The report of the Control Committee, containing its recommendations, has been approved by the Executive Board.

As one of the outstanding activities of the Association for the past year, an activity so valuable as to place us under lasting obligation to the Committee charged with this important task of outlining our future undertakings, it will be more completely reported upon by Mr. D. D. Barnum, the Chairman, at the Wednesday morning session of this Convention. Let me recommend that as a fitting recognition of the exhaustive study and intensive interest of the members of this Committee, all forces combine their best thought and effort toward the successful accomplishment of its program so that it shall deserve commendation of equal worth as was given by Mr. Cortelyou to the former plan when he said:

> "It has, we believe, based on the facts of record, been a controlling factor in shaping the activities of the Association along constructive and up-building lines for the good of the industry and the public served by it."

Probably our foresight, at a time when we are endeavoring to lay plans for the Association and the industry for the next five years, will be more accurate if we take time to consider what the industry as a whole has accomplished by following the recommendations of the Five-Year Program. In thus speaking of Association activities, no attempt will be made to effect

* Presented at General Session, A. G. A. Convention, Atlantic City, N. J., Oct. 13, 1931.

a complete tie-in with that plan and probably more emphasis will be given to some subjects than others in this endeavor to prove that all our actions have been in conformity with and dependent on the Five-Year Program.

In advancing to higher efficiency the methods of manufacture and distribution of gas, the technical work of the industry has in recent years undergone many pronounced changes. However, it can be conceded that one of the outstanding characteristics of the technical men and the technical side of the gas industry has been the practical adaptation to every-day procedure of basic or fundamental chemical and physical control and laws. Such adaptation will be found to have kept pace with the demands of the industry, caused by fundamental changes, as well as the adoption of new discoveries and modifications for technical and economic reasons.

The art of gas production has been advanced through the modern coke oven with its high efficiency and choice of fuel for bench heating and in water gas operation principally by the modification of what was formerly standard equipment and standard operating procedure. Gas from coal will always be in the "scheme of things" and in acknowledgment of this, the Association, as you know, has cooperated with the U. S. Bureau of Mines in a most intensive and inclusive research to determine the qualities of American coals for gas-making purposes.

Rapid changes in the character and the sources of supply of our product will require the employment of skill and ingenuity on the part of all our members in meeting the vexatious and perplexing problems that will doubtless arise in the next few years. Such changes are inevitable and we must anticipate them. For example, consider the developments that have transpired through the past decade in the methods of manufacturing gas. In 1920, carbureted water gas comprised 60% of all the gas distributed by manufactured gas companies; yet in 1930, this kind of gas represented only 37% of the manufactured gas supply. In 1920, 86% of the total gas distributed by manufactured gas companies was produced in their own plants; by 1930, this had diminished to 57%, showing that 43% was purchased from outside the industry.

The rapid expansion of the natural gas industry has been described as one of the most phenomenal industrial developments in the United States in recent years. It will have a far-reaching influence and will continue to contribute much in the way of interest and stimulus to our entire industry. In the space of a few years, due to newly discovered natural gas reserves, containing enormous quantities of thermal energy, this industry has risen to a position of prime importance in the economic and business picture of the entire country. In its expansion, many new markets were obtained in cities formerly served with manufactured gas and in the past five years, this replacement has occurred in nearly one hundred cities ranging in population from 5,000 to 600,000 and affecting over 1,400,000 gas customers.

Today, extensions to new territories are going ahead at a more rapid pace than ever before. The growth of the natural gas business, with its possibilities and problems, has been well recognized by our Association in directing a large portion of its activities to subjects of paramount value to the natural gas industry and through the Natural Gas Department, much has been done in the important measure of conservation and in other technical and research matters. Natural Gas Development, an absorbingly interesting subject, will be ably presented at this Convention.

We are putting to practical use the studies made under the direction of this Association, in the problems incident to the successful changing over of the fuel supply from one kind of gas to another kind, in the utilization characteristics of new gases and mixtures, in the modification of plant operation to meet different kinds of supply, in the construction of mechanical pipe joints, in improved methods of pipe making to meet the stresses of increased operating pressures and in the corrosive characteristics of various soils throughout the country, so as to give reliable information on suitable pipe coverings. The need for advanced research in these fields becomes more apparent as high pressure transmission lines, bearing natural gas, are extended over continually increasing distances in many sections of the country.

I should like to refer to the excellent work of the Industrial Gas Research Committee under the leadership of Mr. F. J. Rutledge, its Chairman. We now know that the solution of many of the problems confronting the industrial engineers and salesmen of the industry, because of their nature and magnitude, would have been seriously delayed unless some highly specialized organization had set itself to the task. The recent report of this Committee, covering their activities and findings for the fiscal year ending July 1, 1931, speaks for itself. This Committee has sponsored twenty-two industrial gas projects, many of them still in progress. Two of these are most interesting because of their possibilities in increasing gas sales, coupled with their great value in contributing comfort and convenience to our customers. I refer to the work undertaken on air conditioning and house cooling, and in gas air jet combustion to bituminous coal, principally for the abatement of smoke. A complete description of this work will be given later by Mr. N. T. Sellman. As the work of this important Committee has advanced, it has earned the support and cooperation of universities, of government bureaus, and private laboratories of industrial concerns.

It is but a few years since the establishment of the American Gas Association Research and Testing Laboratory at Cleveland. This is a notable example of the foresight of the executives of our industry, showing their recognition of the basic fact that if the relations between the gas utility and the customer are to be mutually and entirely satisfactory, the gas utility must exercise some form of influence and control over the quality and efficiency of the appliances installed to serve the customer. Over a period of years, there has been a constant expansion in the Laboratory's importance and usefulness. It is now accepted as an influential factor in the industry and its work is generally recognized

among consumers. Credence is given it by writers and speakers in other industries as a worthy example. We have indeed been fortunate in being able always to secure the services of experts and practical leaders among the personnel of the Managing Committee which supervises the work of the Laboratory and on the General Requirement Committe with its sub-committees. In a large measure, the success of the Laboratory has been due to the energetic efforts and constructive ability of Mr. R. W. Gallagher, who presided over nearly all the Managing Committee meetings for six years, to his successor, Mr. J. S. DeHart, Jr., and to Mr. R. B. Harper, Chairman of the Approval Requirements Committee.

The importance of sales development was well recognized in the former Five-Year Program when it gave the premier place "to improve selling methods, to stimulate selling efforts. . . ."

There have been many and remarkable improvements in our appliances since 1925. Then the gas range did not possess the attractive and appealing features of today; the oven heat regulator and the insulated oven were not important factors in range sales, nor effective in a substantial way in giving customers the maximum in cooking convenience. Automatic water heaters, which now occupy such a necessary place in the convenience, health and sanitation of many homes, were about double their present price. In 1925, gas refrigerators were practically unknown.

To encourage the efforts of sales departments now pioneering the newer uses for gas, I would like to review for you the advancement of the house heating business. In 1922, comparatively few gas sales executives were paying much attention to this class of our sales, campaigns for house heating with gas as a fuel were being undertaken by only a few companies, and special rates for house heating were rare. The effective expansion of house heating was brought about only by the gathering of technical data underlying house heating requirements, the establishment of uniform sales and servicing policies, and the adoption of special rates. During the year 1930, the manufactured gas industry sold over 25,000,000,000 cubic feet of gas for house heating purposes. In 1925, the sale of gas for this purpose approximated only 6,000,000,000 cubic feet, showing a gain in a five year period of over 300% in this class of business.

Success, such as this, has been the result of the crystallization of national sales opinions into basic methods of procedure and, now more than ever, is there a need for a high degree of coordinated effort in domestic, commercial and industrial sales activities to promote the use of gas as a fuel if we are to combat the strongly organized competitive forces that now exist and will accelerate in these fields.

In the development of our appliance business, we have come to carry larger inventories than ever. In cooperative sales efforts we set up the need for flexible selling arrangements. We have liberalized credit requirements and may go still further in this direction.

It has been said that the outstanding fact in the history of the gas industry is *change* and that its noteworthy characteristics are its resourcefulness and determination to meet the conditions of change as they arise. There is no finer example of this adaptability than is evidenced by the invaluable services contributed by the members of the Rate Fundamentals and Rate Structure Committees. Their work has had much to do with the economic and business aspects of our industry and they have kept abreast of the times in devising scientific and equitable methods of charging for our product. Obviously, this is not the place to discuss, to any great extent, the intricacies of rate making. Indicative of our progress, it will be sufficient to state that a review of rate making practices during the past five years indicates two trends of major significance. First, a more widespread appreciation and use of rates embodying a scientific formulation of fixed cost principles, resulting in rates which are not only more equitable to the various classes of customers but are better adapted to promote the gas business as a whole by inducing greater consumption; and second, a more general use of distinct rates for special classes of service.

We have recently witnessed the introduction of the therm rate in America. This method of charging for gas has been in use in England for nearly ten years, where, after encountering opposition and difficulty, it finally became accepted and established. It is believed by these companies which have adopted it here that it will justify its introduction in these localities in America where a product of mixed gases, of substantially higher heating value than is found usually in manufactured gas is distributed, its application being more scientific and accurate. In the selling of industrial gas, to charge on a heat unit basis, rather than on a volumetric standard, seems a logical and constructive step.

The Manufacturers' Section of our Association has taken a very definite step in the formation of its Group Activities. This movement has enlisted the support of the entire gas appliance manufacturing industry and their program embraces such beneficial matters as cross licensing of patents and the adoption of standards of practice so necessary in safe-guarding the interests of the manufacturers, the gas companies, and the public. Evidence of the large amount of attention being given to those problems peculiar to the manufacturer in the conduct of his business was demonstarted by the splendid success of the annual meeting of the Manufacturers' Section, held in Detroit in September, under the leadership of Colonel E. S. Dickey.

Permit me to state here that the great exhibit staged in this hall by the Manufacturers' Section inspires and arouses the enthusiasm of all members of our industry. This is the largest and most complete exhibit of gas appliances and equipment displayed anywhere, at any time. It represents the faith of our manufacturer members in the future of the gas business, who have backed this faith with large expenditures of time, effort and money. Moreover, it is indicative of the spirit of the industry that prevails during these unusual times. Such a remarkable display is indeed worthy of careful inspection, and I urge every

person here, for the sake of his business, to examine it.

The increasing requirements of the industry for statistical data concerning all phases of its operation, have occasioned a corresponding and necessary growth in the work of the Statistical Department of the Association. Beginning in a rather limited manner, four years ago, its services have become so comprehensive and valuable that it is now difficult to see how our industry, or any other, could hope to progress and prosper without some such fact-finding body. Avoidance of duplication and the saving of much time by many committees, of all sections of the Association, was one of the first noticeable accomplishments of this bureau. Its various publications and pamphlets are now of utmost usefulness in keeping before the public, current developments within the industry. The extensive dissemination of statistical information is indicated by the fact that vital portions of it are reprinted each month in many of the newspapers of the country. Its Rate List, with supplements at intervals, enables member companies to have at their disposal accurate and up-to-date information in the entire gas industry. This year, the volume was more complete than ever. The financial sections of its bulletins are now of particular interest to investment banking houses and the financial community and have done much to impress upon the investing public, the general soundness of gas company securities. Surely, this branch of our work during the past several years has been responsive to the needs of the industry.

We wish, at this time, to commend and congratulate those individuals who, through committee service, have accomplished so much during the past years, in the advancement of the Association's educational efforts. It is particularly impressive to note the enrollment in the course in Employee-Customer Relations, sponsored by the Committee on Education of Gas Company Employees under the leadership of Mr. A. J. Sarre, of New Orleans. Although inaugurated only a short year ago, its value has been quickly recognized by leading executives in the industry as the best method of training employees in the correct procedure for dealing with customers. It is significant that this course has enrolled 7,000 students.

One of the outstanding undertakings during the year has been in connection with the sale of gas appliances. In order to approach clarity of thought and unity of program in merchandise sales between the utilities, the merchants and plumber-dealers, who also sell gas-burning appliances, the Executive Board, last December, created a committee of responsible executives, most of them directors of this Association, known as the Allied Trades Committee, to review the entire situation and to consider the preparation of a statement of the policy of the industry.

The "Principles Suggested for the Guidance of Member Companies as a Basis for Promoting Cooperative Trade Relations" emanating from this Committee as a result of their investigations, discussions and conferences, by reason of their adoption by the Executive Board, now represent the official policy of the Association on these matters. These principles are doing and will do much, to improve trade and dealer cooperative movements, to promote the sale of approved gas appliances, to better the relations existing between utility companies and the public, and to prevent unwise and unnecessary legislation. Furthermore, it is highly gratifying that an increasing number of our members, including both gas companies and manufacturer companies, are now conducting their merchandising business in accordance with this statement of principles. Here is the personnel of this Committee, who contributed such distinguished and notable service toward the adjustment of this mutual interest of utility and dealer:

Oscar H. Fogg, *Chairman,* Consolidated Gas Co. of New York, New York.

H. C. Abell, Electric Bond & Share Company, New York, N. Y.

Henry L. Doherty, H. L. Doherty & Company, New York, N. Y.

P. H. Gadsden, The United Gas Improvement Co., Philadelphia, Pa.

Sanford J. Magee, Associated Gas & Electric System, New York, N. Y.

B. J. Mullaney, The Peoples Gas Light & Coke Co., Chicago, Ill.

Arthur Stockstrom, American Stove Co., St. Louis, Mo.

C. E. Paige, Brooklyn Union Gas Co., Brooklyn, N. Y. (ex officio)

Colonel Fogg, as Chairman of this Committee, deals with this subject in the report of the Committee to this Convention.

With this limited review of the progress and development of the industry along the lines recommended by the original Five-Year Program, there is every reason to expect that a corresponding advancement will occur under the guidance of a similar schedule.

If we were to summarize the aim and the purport of all our activities in as few as possible words, we should probably boil down to the expression "SELL MORE GAS." The American Gas Association has that for its principal objective in its service to its members. The ramifications of its activities; its highly departmentalized organization; the hundreds of men who serve on its committees; in fact, this very Convention itself, indicates to everyone the interest this industry has in increasing the use of its product, and there is every reason why it should do so.

If we are a forward looking and forward going industry, we must justify the faith our stockholders had in spending their money with us. We must extend that faith in order to insure future credit. So first, we have the stockholders' interest. By making our product more available, useful for more purposes, as well as more economical for the consumer, we are contributing toward a substantial public convenience. So our second great incentive to grow is for the good of the community. If we are able to popularize our appliances; if we are able to get consumers interested in what our product will do for them, in either their homes or their factories, we are able to employ more people and offer more good opportunities for advancement. And in these trying times, this is no small contribution to the public welfare. So our third objective is that the promotion of the sale of gas is important because it offers more em-

ployment and more opportunity for people, as sales increase.

We have come to this Convention with feelings of disturbance and uncertainty as to the general business in our country and abroad. We are here, however, confident that whatever may eventuate, our business has withstood magnificently the assaults made on all industry. We, as an industry, have by comparison held our own and indeed have been able to lend some degree of confidence and stability to community life. We have the advantage of being a basic industry, selling a necessity to a people who must have it.

There is no gainsaying that unemployment approaches the status of a national crisis. Plans, local and national, are being formulated for the alleviation of distress.

Many suggestions have been offered. Perhaps the most comprehensive program is that offered by Mr. Gerard Swope. The press indicates that there are differences of opinion as to the theory and practicality of this program. Coming from such a man, it is worthy of the most careful study and consideration.

Under date of September 30 we received a letter from Mr. Eliot Wadsworth, Chairman, Committee on Cooperation with National Groups and Associations. This is a Committee operating under The President's Organization on Unemployment Relief, of which Mr. Walter S. Gifford is Director. Mr. Wadsworth's letter follows:

"Gentlemen:

"I write to call attention to a very special service that your organization can render at this time in the national aspects of our work.

"The work is based upon the broad policy that unemployment relief, to be effectively carried out this winter, must be dealt with by each local community.

"It is of the utmost importance that every force should be available for unified local effort to meet the situation.

"The Committee on Cooperation is charged with the duty of inviting all organizations to participate in the work. I, therefore, write to ask if your organization will take upon itself the responsibility of communicating with its local units throughout the country, urging them to support and participate in unified local unemployment relief activities.

"It is expected that most of the appeals for funds will take place between October 19 and November 25, so the element of time is important, but it is not alone in the raising of money that help is needed. The task of wisely rendering aid to the unemployed for months to come will call for continued effort in which many can participate.

"Any action that you may take will be greatly appreciated. We should like to consider your organization as one of those actively cooperating with the President's Organization. With your approval, we will add your name to the list, and would be glad of information as to any steps taken.

"If there is any further information you need, please do not hesitate to write or telegraph.

"Sincerely yours,

(Signed) ELIOT WADSWORTH"

Chairman, Committee on Cooperation with National Groups and Associations

We have advised Mr. Wadsworth that his letter would be read at this session and that the American Gas Association, as always, would cooperate to its fullest ability in this matter. Further communications will be sent to Company members as circumstances require.

It was a pleasant duty and a great honor as your presiding officer in company with the Managing Director, to represent the American Gas Association at the first International Gas Conference held in connection with the 68th Annual General Meeting of the Institution of Gas Engineers in London last June and it was our privilege to explain to that assembly the achievements of the gas industry in America by reason of the cooperative work of our great national organization. It would be difficult for me to over-emphasize the very cordial reception afforded to your President and Managing Director at this meeting by members of the gas industry over-seas.

During his visit abroad your Managing Director, Mr. Alexander Forward, had the honor of speaking for all foreign associations represented at the Breslau meeting of the German Gas and Water Association. These visits to foreign countries not only afford the opportunity to present the greetings of the gas industry of America but do much to cement the friendly relations existing in the gas fraternity and provide for a better interchange of valuable information on the operations of gas companies here and abroad.

This is probably the most appropriate time that will ever be available to me to express my personal pleasure in serving this Association as its tenth president. It has been a privilege and an honor. It is with sincere thanks that I express my appreciation of the loyal and generous support and cooperation afforded me by the members of the Executive Board, and I now make grateful acknowledgment of the splendid and constructive work of the many committees having charge of sectional and general activities so essential to the success of the industry, through this Association. You are all invited to attend the afternoon session of the various sections and can learn firsthand there, the beneficial results obtained from this past year of faithful labor.

It is neither possible nor in my opinion necessary to determine the extent to which the industry's progress has been due to the leadership of the Association, and how much has been due to the foresight and progressive administration and management of the member companies throughout the country. As President of your Association, I think it is desirable for me to say that few members, other than those designated to serve as Association officers from year to year, recognize the extent to which many of the progressive policies and movements now generally accepted throughout the industry, to its great benefit, have originated at Association Headquarters, to be given practical and effective expression later through the committees, officers, and leaders of the industry.

While the industry has every right to expect the high degree of unselfish service which it has received from Headquarters, these services merit full appreciation by every member. As President, I consider it a pleasant duty to call them to your attention. I wish to express my deep and real appreciation of the remarkable work of Major Forward. No task too small, no order too large, he has given unstintingly of his talents. He has done us all a wonderful service. One cannot think of Major Forward without thinking too, of the loyal members of his Staff. Devoted and faithful, even Major Forward, without them, could not have

(Continued on page 517)

A. G. A. Prepares For Enlarged Public Service*

By Alexander Forward

Managing Director, American Gas Association

Alexander Forward

DURING the fiscal year just ended the Association devoted itself to concentration of its energies and to careful preparation for future years of enlarged public service.

What has been done, and how and by whom it was done, will be related by the President in his annual address.

The inherent soundness and stability of the gas industry was never more effectively demonstrated than during the trying year 1930.

During that year the revenues of the industry in the United States aggregated $870,000,000. To the service of its more than 16,000,000 customers was dedicated an investment of upwards of $5,000,000,000.

In 1930 the amount of natural gas consumed in the United States reached the record figure of 1,941,000,000,000 cu.ft. Of this total some 16 per cent was consumed for domestic uses, 4 per cent for commercial purposes, 37 per cent was used in drilling oil and gas wells and other field operations, 5 per cent as fuel in petroleum refineries, 14 per cent in the production of carbon black, some 6 per cent for the generation of electric power while the remaining 18 per cent was used by other classes of industrial customers.

Domestic consumption of natural gas in 1930 aggregated 305,000,000,000 cu.ft., while the number of domestic customers totalled 5,100,000. Another significant feature of these data was an increase of some 7 per cent in the quantity of natural gas consumed in the generation of electric power.

Despite the generally lower price levels of competing fuels prevailing throughout the year, sales of the manufactured gas industry aggregated 522,900,000,000 cu.ft., or substantially the same as for the preceding year. Sales of gas for house heating purposes registered a pronounced gain during the year, the increase amounting to nearly 28 per cent.

The declining trend in water gas production continued during 1930. The amount of retort coal gas also declined by nearly 7 per cent. The pronounced drop in the production of oil gas resulted from the introduction of natural gas into territories where oil gas had previously constituted one of the major sources of gas supply.

On the other hand there was an increase of more than 4 per cent in the quantity of by-product coke oven gas produced in the plants of gas utilities. There were 21 such plants operated by utilities at the end of 1930.

Coke oven gas purchased from merchant coke and steel companies registered no material change during the year, in sharp contrast to the increased trend toward purchased coke oven gas during preceding years. At the end of 1930 there were 34 plants supplying coke oven gas for distribution by gas utilities. Of these 34 plants 18 were connected with the iron and steel industry, while 16 were operated by merchant coke companies.

These changes in gas production are reflected in the fuel requirements of the industry. The amount of coke consumed by the industry itself declined for the third successive year, dropping from 4,188,000 tons in 1928 to 3,870,000 tons in 1930. Of this total 2,275,000 tons were consumed as generator fuel for water gas manufacturer and 1,595,000 tons were used as bench and boiler fuel.

In 1930 the operating revenues of the industry aggregated more than $537,000,000 which was a decline of less than one per cent from the banner year 1929.

Operating expenses registered a decrease of more than one and one-third million dollars dropping from $299,872,000 in 1929 to $298,557,000 in 1930.

Again I call attention to the continued and persistent increase in taxes paid by manufactured gas companies. In 1924 taxes constituted 8.7 per cent of the operating revenues of the industry, whereas by 1930 this rate had risen to 9.6 per cent.

*Annual Report submitted before General Session, A. G. A. Convention, Atlantic City, N. J., Oct. 13, 1931.

An especially significant feature of these data was an increase of nearly 2 per cent in fixed charges during 1930. This was doubtless in part a reflection of conditions prevailing in the security markets throughout most of that year which favored the flotation of bonds rather than stocks.

This increase in fixed charges also reflects in part the response of the gas industry to the government's plea for increased capital expenditures and demonstrates the faith of the companies in the soundness and stability of their industry by expanding capital investment in a period of slackened sales.

At the close of 1930 the manufactured gas industry in the Dominion of Canada served 546,000 customers, an increase of 3 per cent during the year, while the investment dedicated to these patrons aggregated nearly $66,000,000. Nearly 19,000,000,000 cu.ft. of gas were produced and sold during the year.

A decrease of only 7 per cent in gas sales and 4 per cent in revenues is indicated by the comparative operating reports of manufactured and natural gas companies for the first eight months of 1931.

In considering these comparative data it may be mentioned that during this same eight-month period the production of bituminous coal declined more than 17 per cent from the corresponding interval of 1930, the output of crude petroleum dropped 8 per cent, pig iron production was down 41 per cent and steel ingot production 36 per cent. During this same period the number of freight cars loaded dropped 18 per cent while the production of automobiles declined by more than 26 per cent.

Reports from a group of natural gas companies representing more than 85 per cent of the public utility distribution of natural gas indicate sales of nearly 465,000,000,000 cu.ft. for the first eight months of 1931, a decline of only 9 per cent from the corresponding period of 1930. The revenues of these companies for the same period aggregated about $193,000,000, compared with $206,000,000 a year ago.

The consumption of natural gas for the generation of electric power during the first eight months of 1931 continued at a rate about 8 per cent above the preceding year, despite the fact that during the same period the production of electric power decreased by nearly 5 per cent.

Reports from manufactured gas companies representing over 90 per cent of the manufactured gas industry indicate sales for the first eight months of 1931 of 237,000,000,000 cu.ft., a decrease of only 2 per cent under the corresponding period of 1930.

The declining trend in water gas production continued during the current year, production for the eight-month period averaging more than 3 per cent under the levels of the previous year. The quantity of coke oven gas produced however increased 8 per cent.

A thorough-going spirit of mutual helpfulness and cooperation pervades the gas industry. Our member gas companies, member manufacturer companies, individual and associated members, are always ready to contribute to the activities of the Association. It is a pleasure and privilege to work in such an atmosphere.

There has been a steady advance in cooperative work with other organizations. State and regional organizations with which we are affiliated are a source of great strength to the industry and their ready help is of significant value to the Association.

National associations such as the American Society for Steel Treating, and others that could well be named, doing very valuable work in their own fields have afforded us the opportunity for cooperative effort by close association of committee work and by participation in national exhibitions.

The Association enjoys a valued membership in the Chamber of Commerce of the United States of America and regards this organization and its activities as an important factor in our national life. The Chamber is now engaged at the instance of the American Gas Association in a study of the effects of taxation upon the final cost of living. This work when placed before the citizenship of the country should be highly informative and illuminating.

As an outstanding industry the Association is interested in the development of plans for the Chicago Century of Progress Exposition in that city in 1933. A capable committee with appropriate subcommittees has been following the matter carefully and our connection therewith is at present in their hands.

Headquarters staff has again rendered exceptionally loyal and valuable service, with great sincerity of purpose and of this splendid assistance and support I make grateful acknowledgment.

The gas industry may well be proud of the leadership concentrated in its elected officers and its Executive Board. Diligent in action, attendance, on the alert to grasp the essentials of Association activities, broad and comprehensive in outlook, they render invaluable service to everyone in the business. Our President, Mr. Paige, our vice-presidents, Messrs. Gallagher, Hewitt and McGowen, and our treasurer, Mr. Welsh, have been sources of the greatest strength, and their counsel and cooperation have been always readily available. The industry may well be appreciative of the quality and record of those who have served as its officers and directors and in years to come it will be even more appreciative of what has been done during the administration of Mr. Paige.

Sir Francis Meets President Hoover

SIR FRANCIS GOODENOUGH, C.B.E., who was one of the principal speakers at the A. G. A. Convention, was presented to President Hoover at the White House, Washington, D. C., on October 16. Accompanied by Alexander Forward, managing director of the Association, the visitor was escorted to the White House by the Chaye d'Affaires of the British Embassy.

Later, Sir Francis and Lady Goodenough and Mr. Forward attended luncheon of the English Speaking Union. A table was occupied by G. A. G. Wood, president of the Washington Gas Light Company, Mrs. Wood, Mr. Woodhead, vice-president of the company and Mrs. Woodhead; Mr. Fraser, who was in Atlantic City for the company, and Mr. John B. Klumpp.

Sir Francis Goodenough

Sees Golden Rule As Today's Business Need*

By Sir Francis Goodenough, C. B. E.

Executive Chairman, British Commercial Gas Association

I AM down on the program as if I were to read a paper to you on the "Economics of Selling Gas," which I assure you I have no intention of doing. I think it would be a great bore to you if I did. But I want to tell you this morning something of what I feel in being here today and talking to you as one friend to another.

This is a day I have looked forward to with the very greatest of pleasure and anticipation. For years I have been trying to come over to America and I want to tell you how glad I am to be here today. First of all, I should like to tender this Association my cordial congratulations upon the attendance at this convention in such times and in such weather.

I certainly congratulate you on the weather; but I don't congratulate you on being indoors—listening to me—when you have such lovely air and sunshine waiting for you outside.

I also want to congratulate you on the wonderful exhibition which I had the pleasure of visiting yesterday. It is indeed a great credit to all concerned in its assembly. And then let me congratulate you most heartily upon your President. I had the great pleasure of meeting him on the other side when he came over this past summer. I want to tell you what an impression Clifford Paige made in England. As my good friend Canning has told you, he made a great impression at the meeting of the Institution of Gas Engineers where he presented a valuable paper and then gave us an address that will long live in the memories of those who heard it. I had the pleasure of meeting him immediately upon his arrival in London and it so happened that I was able to take him with me to a dinner given in honor of the Prince of Wales and his Brother Prince George upon their return from South America. I was moreover fortunate enough to secure the privilege of presenting Clifford Paige to the Prince.

As soon as the Prince looked him in the eye, he obviously said to himself: "Here is a man." And he did not just give him a word of cordial welcome, but he took him to one side and sat down with him on a sofa and talked to him for ten solid minutes. And that did not satisfy the Prince. He afterward came over with Clifford to where I was standing and said "I should like to have another talk with Mr. Paige. I wish you would bring him over to the Palace to see me next week."

That was fixed up and Clifford had the pleasure of being received by the Prince in his own home and he had conversation with the Prince for something over half an hour. That made it comparatively easy for me to do a difficult thing—that was to secure him a "command" to attend the Levèe of the King the following Monday. At that Levèe the Prince of Wales, standing beside the King, without taking any direct part in the ceremony, showed Clifford that he recognized him as he went by. And when I met the Prince a little later, and I told him how much Clifford had appreciated his kind courtesy, he said to me that it had been a great pleasure to him to meet such a fine representative of the United States.

That is what we think of him over there. And I can tell you how proud I was of him of making a friend of him and how proud I am to be here today under his presidency.

It is also a great pleasure for me to meet again here some of the very good friends that I have made in the American gas industry during a fairly long period of time. It is 18 years since Oscar Fogg came over and read a paper at a B. C. G. A. conference in London and made many friends. It is quite a long time since Bernard Mullaney and Frank Blanchard and Merton Robbins came over to an advertising convention and endeared themselves to us. And of course it is always a delight to meet Alexander Forward who has made friends on the other side on more than one occasion.

I was very happy when Clifford spoke of Friendship as one of the outstanding features of my connection with the American Gas Industry.

More precious far than gold refined
Is friendship, knit with heart and mind;
Gold may go its fickle way,
But friendship, tried, will ever stay.

* Delivered before General Session, A. G. A. Convention, Atlantic City, N. J., Oct. 13, 1931.

Then is has been a very great delight to my wife and myself to visit this country for the first time and see your wonderful city of New York. I have fallen in love with New York—although as I said last night I don't want to live there—but it is a most wonderful city and I think that your skyscrapers are some of the most beautiful buildings that have ever been erected, and I know that my architect friends who have been over here say the same. Your architecture is superb and we admire it.

When we come over here, we are generally asked, I believe, what we think of your women. Well, I said last night that I thought so well of them that I had better not say how much. But I would like to say that my wife and myself have made some very delightful friends among your women and they can regard me as the latest recruit to their army of admirers.

I have been asked what I think about prohibition, but I understand that it is a prohibited subject, so perhaps I had better not say anything whatever about it—indeed I really haven't seen too much of it. Now what I particularly wanted to do here this morning was to express my indebtedness to America as a whole and to the American Gas Industry in particular for the inspiration and help which I have received during all of my business life.

I have always been a great admirer of your United States. As a school boy I was one of your rebels. Had I been here in the early days I would have enlisted under Washington. I think very much more of George V than I did of George III, and we are very fortunate today in having an entirely different George on the throne from the one who threw away the finest colony Britain ever had.

Franklin, Washington, Lincoln, have been among my heroes all my life. Emerson and Walt Whitman have been an inspiration to me, and your modern leaders in commerce and industry have been a wonderful help and inspiration through their zest and activity and adaptability, courage and enterprise, and above all, their high ethical standards in the conduct of business. I look to the leading business men of America as outstanding personalities that every boy and young man and every older man in business can well study and wisely follow.

Then I owe a special debt of gratitude to the American gas industry and to this association because it was the work which the National Commercial Gas Association of America was doing in the old days that helped to give me ideas in regard to the formation of the British Commercial Gas Association on the other side. And it was an American who first gave me something like a full picture of what gas companies can do in the way of developing by advertising in the days when the gas industry in England had not begun to advertise at all. Some years ago he passed on, but I should like to refer today to Mr. Humphrey, the maker of the Humphrey Lamp who gave me an enormous amount of assistance by collecting throughout the length and breadth of the United States samples of its advertising and publicity matter when I was just beginning my career in the gas industry. I am glad to know Mr. Humphrey's firm is still continuing to serve the gas industry although I am sorry that he is no longer with us.

There is no competiton between us in the gas industry on both sides of the Atlantic, except the competition to serve the public more and more efficiently. I would like to quote from one of your poets—

Not chance of birth or place has made us friends,
Being oftentimes of different tongues and nations,
But that we endeavor for the self-same ends,
With the same hopes and fears and aspirations.

That is the common bond between the British gas industry and the American gas industry.

There is a great need for good will and cooperation between all of us in both nations in order to overcome the difficulties of the present situation. Those difficulties are nothing but temporary on either side of the Atlantic. Both countries are sound in wind and limb. There is no occasion for any of us to be disheartened. I think that what is wanted is the recovery of a spiritual outlook on life, the practical application of the Golden Rule in all our affairs. There is too much narrow nationalism today and not enough inter-nationalism. We shall never find salvation through selfishness. We shall never find salvation through conquest, only through contact and mutual service.

We will recover before long, especially if we all cooperate to that end. The old saying, "Heaven helps those who help themselves," has got to be revised to, "Heaven helps those who help each other."

I believe it is through mutual cooperation that we are going to find our way out. I wonder whether all of you remember what John Ruskin wrote:

So far as you desire to possess rather than to give;
So far as you look for powers to command instead of to bless;
So far as your own prosperity seems to you to issue out of contest or rivalry of any kind, with other men or other nations;
So far as the hope before you is for supremacy instead of love and,
Your desire is to be greatest instead of least, first instead of last;
So long you are serving the lord of all that is last and least,
The last enemy that shall be destroyed —Death.

Mr. President, may we of the Gas industry on both sides of the great ocean on whose historic shores we stand today—by cultivating in all our relations with the public and with each other the true spirit of friendship, goodwill and cooperation, and by carrying that further, individually and collectively, into all our international relationships—pay our part, wisely and bravely, in bringing about the elevation of all human transactions to the higher plane on which and on which alone, can dwell lasting peace and true prosperity.

Missouri Association of Public Utilities

THE next annual convention of the Missouri Association of Public Utilities will be held April 28, 29 and 30, 1932 in Excelsior Springs, Missouri, according to an announcement made by Assistant Secretary Jesse Blythe.

Developments In The Natural Gas Field*

By JUDGE H. O. CASTER,
General Counsel, Henry L. Doherty & Company

Judge Caster

IT is estimated that there are two billions of dollars invested in the natural gas industry in the United States, that there are fifty-five thousand gas wells, seventy-two thousand miles of main and gathering lines, and fifty thousand miles of distributing mains serving a population of twenty-two million. There were 20 per cent more customers in 1930 than in 1928, and the investment in natural gas properties has almost doubled in the past five years. This very rapid increase in the number of customers and in the amount of investment is due, primarily, to the discovery and development of four or five major gas fields and a great number of smaller ones.

Natural gas is generally discovered as a by-product in the search for oil and when discovered, if not used, it is very often allowed to be wasted by blowing in the air. Many times as much gas has been thus wasted as has been put to efficient use.

It has only been a very few years, comparatively speaking, since geologists were first employed to locate oil structures. The information that they possessed was meager, and confined largely to surface indications. In a short time, most of the structures that could be thus located had been exploited. However, during the last 15 or 20 years a great body of information on sub-surface geology has been obtained through logs to wells drilled, scouting, and geological records kept by the various oil companies; until in the major oil producing states, such as Kansas, Oklahoma, Texas, California, New Mexico, Arkansas, and Louisiana, there is hardly a section of the state in which the geologists do not have an accurate knowledge of the sub-surface geology. They can ascertain readily what formations will likely be encountered from the surface of the earth to the oil sands.

This accumulated knowledge added greatly to the efficiency of the geological staffs of the oil companies, and enabled them to discover enough oil to take care of the ever increasing demand; and since the war, with the exception of 1926, it has enabled them to put oil into storage. Core drilling was used to locate sub-surface structures, and a number of pools were opened through this method.

In the last five or six years the so-called geophysical methods have come quite commonly into vogue. The use of the seismograph, the torsion balance, and the magnetometer have enabled the searchers to locate structures which they heretofore had been unable to find.

This increase in the knowledge of discovering oil has led to its great over production and, at the same time, to a very great overproduction of gas. This increase of knowledge may lead to the early discovery of all the principal oil and gas pools or fields in our country and, consequently, lead to a much earlier exhaustion of our gas and petroleum resources.

Much of the oil and gas now produced is being sold at less than the cost of production. Undoubtedly, there is a sufficient quantity of natural gas to serve the pipe lines now built, and the markets now served, during our generation. Nevertheless, it behooves our government to protect our vanishing natural resources for the longest possible period of time for future generations.

The reserves of some of the principal fields are estimated as follows:

Panhandle (Texas)	
Open flow	12,254,000,000 cu.ft.
Reserve gas	10,312,000,000,000 cu.ft.
Gas produced to date	1,000,000,000,000 cu.ft.
Productive and proven acreage	1,289,000 acres
Number of wells (gas)	650
Reported wastage per day	500,000,000 cu.ft.
California (State)	
Open flow	1,100,000,000 cu.ft.
Reserve gas	7,000,000,000,000 cu.ft.
Productive and proven acreage	75,000 acres
Kettleman Hills	
Open flow	250,000,000 cu.ft.
Reserve gas	5,000,000,000,000 cu.ft.
Hugoton (Kansas and Oklahoma)	
Open flow	800,000,000 cu.ft.
Reserve gas	6,000,000,000,000 cu.ft.
Gas produced to date	Small amount
Productive and proven acreage	1,000,000 acres
Number of wells (gas)	150
Monroe (Louisiana)	
Open flow	4,435,000,000 cu.ft.
Reserve gas	2,712,000,000,000 cu.ft.
Gas produced to date	1,400,000,000,000 cu.ft.
Productive and proven acreage	250,000 acres
Number of wells (gas)	850

* Delivered before General Session, A. G. A. Convention, Atlantic City, N. J., Oct. 15, 1931.

Southeastern New Mexico Gas Area

Open flow	367,000,000 cu.ft.
Reserve gas	1,521,000,000,000 cu.ft.
Gas produced to date	Small amount
Productive and proven acreage	100,000 acres
Number of wells (oil and gas)	160

Southwestern Wyoming Gas Area

Open flow	683,000,000 cu.ft.
Reserve gas	560,000,000,000 cu.ft.

South Central Kansas Gas Area

Open flow	971,000,000 cu.ft.
Reserve gas	280,000,000,000 cu.ft.
Number of fields in area	15
Productive and proven acreage	15,000 acres
Number of wells (oil and gas)	125

Oklahoma City

Open flow	? very large
Reserve gas	253,000,000,000 cu.ft.
Gas production greatly affected by oil production	
Productive and proven acreage	10,300 acres
Number of wells (oil and gas)	750

Central Wyoming Gas Area

Open flow	744,000,000 cu.ft.
Reserve gas	200,000,000,000 cu.ft.
Number of fields in area	11

Tioga (Pennsylvania)

Open flow	404,000,000 cu.ft.
Reserve gas	100,000,000,000 cu.ft.
Gas produced to date	Small amount
Productive and proven acreage	4,500 acres
Number of wells (gas)	21

Jackson (Mississippi)

Open flow	1,134,000,000 cu.ft.
Reserve gas	25,000,000,000 cu.ft.
Gas produced to date	Small amount
Productive and proven acreage	3,200 acres
Number of wells (gas)	50

Wayne-Tyrone (New York)

Open flow	286,000,000 cu.ft.
Reserve gas	16,500,000,000 cu.ft.
Gas produced to date	Small amount
Productive and proven acreage	5,500,000 acres
Number of wells (gas)	76

The estimate of the reserves of these fields is approximately thirty trillion cubic feet.

In such fields as the Panhandle, Texas, and the Hugoton, Kansas, gas is found in a lime and granite wash formation. The cores of these sands show that in the lime the porosity varies all the way from cavities as large as marbles to a rock so dense that gas cannot permeate it. How much of this lime formation in the field is saturated cannot be accurately determined, nor can its porosity be accurately estimated. The quantity of gas in the sands and in these formations depends upon the area of the field, the porosity, the thickness of the sand, and the well pressures. These vary greatly in different pools. In the Panhandle the initial pressure ranges from 430 to 470 lbs., while at Oklahoma City the well pressure is almost 2,000 lbs. The Hugoton, Kansas, area has the same general sand formation as the Panhandle, Texas, field. However, the initial open flow of wells in the Hugoton field is only about one fourth of that of the wells in the Panhandle field. The reason for this difference is generally ascribed to the difference in the porosity or density of the sand.

Some gas fields consist of a series of pools, while others cover a large and continuous area. It is generally thought that the Panhandle field, consisting of more than one and one-quarter millions of acres, is one great pool. While the largest estimated production per acre is 15 million cu.ft., there are a number of wells which have produced more than three billion cu.ft., which indicates that the gas travels considerable distances through the sand.

The life of these pools and the amount of gas that can be recovered and marketed depends, of course, upon the amount of gas in the sands, but it depends to a large degree upon how much of this gas can be conserved for the markets and how much of it is allowed to be wasted. At the present time in many of the principal fields, such as the Panhandle, more gas is blowing in the air than is being taken out and used.

The production of these great quantities of gas in the various fields led to its transportation and sale in all of the available near-by markets. Pipe lines were originally thought to be the limit in length when they had reached markets one hundred miles away, but now gas is being transported to markets one thousand miles away from the fields.

Before gas could be piped these long distances, it was necessary that improvements be made in transmission facilities. Until six or seven years ago the largest pipe lines were 16″ and 18″ in diameter, and were constructed of lapweld pipe. Gas was being transported through these systems at 300 to 350 lbs. pressure. Some of the modern long distance lines have diameters as large as 24″, and even 26″, and are constructed of seamless or electric welded pipe. The quality of steel used in modern pipe line construction is very much improved over that used a few years ago. Gas can now be safely transported through a modern pipe line system at from 600 to 800 lbs. pressure with as great a degree of safety as it was originally transported at lower pressures.

It was necessary not only to have

improved quality of material in pipes, but it was also necessary to build compressors, and to manufacture couplers and valves to meet the demand of the higher pressures. The engineers and manufacturers have done a great deal toward the solution of these questions, but research is constantly going on, ever seeking to transport gas at a diminished price in order to enable the industry to carry its supply from the fields to more distant markets.

The investment in these superlines is enormous, and it behooves those who are contemplating the undertaking of their construction to make the most careful study, both of the field to determine the adequacy of the supply, and to the market, to be assured that reasonable rates can be secured over a sufficient length of time to amortize the investment.

These huge investments in the pipe lines must be amortized and the money returned with reasonable profits on the investments during the life of the fields reached; or the lines must be extended by added investments to other fields and the gas transported over longer distances to reach the same market. In this sort of an investment there is added what gas men, for want of a better term, call "mining hazard." This mining hazard consists of several different factors; that the pool or fields may not produce the gas estimated; that more gas will be wasted than was anticipated; that proper conservation laws will not be enacted or enforced; and, last but not least, that other large pool or pools may be opened sufficiently close to the markets served to render the investment in long lines valueless. All of these factors should be taken into consideration before investments in pipe lines are made.

Most of our cities are served by water work systems, which take the water from rivers and deliver it to the customers' spigot. Water does not cost anything. The consumer can take his bucket, go to the river, get the water and carry it home for himself, and it will not cost him a cent; but the water company takes it from the river, purifies it, delivers it to the customer's house where he can have it in abundance whenever he wants to turn the spigot. The same is true of natural gas. The pipe line company makes these enormous investments in pipe lines; it takes its chances in the mining hazards; it realizes that it must give absolutely perfect service. The gas is delivered through the distributing company to the customer, who can cook his meals, heat his water and his home by merely turning on the gas. He sets his thermostat and his house is kept at an equal temperature day and night during the entire winter season. He carries in no wood, he carries out no ashes, and he pays for his gas after it is consumed. The gas company has brought the wood box and the coal bin into the house, has put the fuel on the fire as it is needed, and has serviced the furnace without the least bit of work on the part of the consumer.

It is this service for which the consumer pays. No one has ever heated their house with natural gas and wanted to turn back. It is a de luxe heating service not furnished by any other fuel.

The gas thus transported and sold is in competition with other fuels. It is in competition with electricity in cooking and water heating. It is in competition with coal and oil in house heating, and is in competition with the cheapest forms of fuel in industrial uses.

The householder is willing to pay a fair price for gas or electricity to cook his meals and heat his water because the cost is comparatively small, but when it comes to heating his house, he considers what form of fuel is the cheapest and will only use the preferential gas service if it is sold to him in comparative competition with these other fuels. But the service must be 100 per cent. If the gas main breaks and the householder is without fuel to heat his house in cold weather, it is not the kind of heating service he wants. Gas must be at his meter whenever, and in the quantities, he wants.

To maintain this service, the pipe lines must be kept in the very best of operating condition. Crews must be ready at a moment's notice to repair any breaks or leaks in the line. Pressure must be built up against the approaching storms, wells must be turned in, compressors must be run. The efficiency in the transportation of gas has been practically perfect, and it is this service that the customer receives. It comes to him so naturally, and is so perfect, that he does not realize the cost and the skill necessary to give it to him.

The manufactured gas company has been largely supplying the cooking and water heating services in the towns where it operates. It sells comparatively small quantities of gas per customer at a comparatively high price. The natural gas company must transport its gas in large quantities, must sell it for house heating and industrial purposes, and at a load factor which will enable him to earn a reasonable rate upon, and to amortize its investment.

Where a pure natural gas service is given in a city, it is necessary to provide an adequate quantity to take care of the domestic demands in case of sudden and rapid falls of temperature. Gas may be transported at from thirty to sixty miles an hour. It will thus be seen that when it is transported three or four hundred miles, or more, it will be several hours from the time the gas leaves the well until it is at the customer's meter. To take care of this increased demand, it is necessary to carry a reasonable amount of industrial gas, with proper cut-off contracts so that a stream of gas will be coming into the markets which can be diverted quickly into the domestic consumers' mains. This industrial gas must be sold, whether at a profit or not. It is a necessary incident to a proper domestic service. Again, the industrial consumers must be taken care of. It is most highly desirable that natural gas companies supply these industries with a heat service, providing oil service when it is necessary to take care of the domestic consumers. It is good business for the gas company to maintain this stand-by service, with both oil and gas burners so that they can turn off the gas and on the oil, and vice versa, when needed. Thus the industrial consumer is able to get this preferential fuel at a price he can afford to pay for it. Large amounts of gas are sold to industries which cannot be thus

used. It is unfortunate, indeed, that the super-abundance of gas has forced it into the markets and displaced the cheaper sort of fuel. If the gas could be reserved for the higher uses, such as domestic and preferential industrial use, the public in general would receive a great deal more benefit and over a great deal longer period of time.

A great many gas ventures have been entered into where the economics of the situation did not justify them. When the banker has learned that gas can be procured in the field at such a small cost, and when transported at 100% load factor can be delivered so cheaply at the markets, he thinks enormous profits can be made in these ventures and he has readily supplied the money. He does not appreciate the mining hazards which are encountered, nor does he appreciate that a number of years of experience are necessary to operate such a system; accordingly, great sums of money have been invested in pipe line ventures which will never be returned to the investors. However, when the gas supply in the field is adequate, when reserves are procured which justify the venture, and when the pipe lines are operated by skilled and experienced operators, natural gas securities are first-class investments.

I have referred herein to the Amarillo gas field because at the present time it is the source from which three major, one-thousand-mile pipe lines either have been, or are being constructed.

I wish time would permit a discussion of a few of the other major fields, such as the Kettleman Hills, field in California, the Monroe field in Louisiana, and the general gas fields in West Virginia, but it does not. Each of these fields, however, has its peculiar sand conditions, different well pressures, and different problems which require independent solution.

It is not safe to build a major pipe line project from a new and untried gas field. When the gas fields of Kansas and Oklahoma were opened in the early part of the century, it was thought that they would supply the markets for from fifteen to thirty years. This judgment was largely based on information secured from experiences in the West Virginia and Pennsylvania fields. However, the gas supply in practically all of these Kansas and Oklahoma fields was exhausted in from two and one-half to three and one-half years. The pipe lines were constantly searching for new fields and new pools; rates were based on such a low level that most of the large pipe line companies were eventually forced into bankruptcy and receivership, and the public suffered from the lack of gas.

The Hugoton field in southwestern Kansas is very large in extent and is estimated at around one million acres, but no one can tell how much gas it will produce, nor how long it will last. It is an untried field; it has had no pull to date and, while it is generally believed that there is an enormous supply of gas there, it would be hazardous to build a major line depending upon it for its source of supply.

Constant study must be made of the markets in order to supply them with just the service which their particular markets or community requires. The industry must constantly strive to secure better appliances to the end that the customer may get the greatest value out of the gas sold. There is a limit below which the gas company cannot sell its gas, but markets may still be made available by its better and more economic use through improved appliances.

One of the great problems of the natural gas company today is to sell its product in such a way as to give the pipe line the necessary load factor. A domestic house-heating load is carried at a very poor load factor, as there is no demand for it during a great many months in the year. Nevertheless, the pipe line company must enter into purchase contracts with the producer and give him sufficient takes, and on a sufficiently good load factor, to induce the producer to continue drilling and supplying the pipe line with gas.

We are already at the dawning of the day when gas will be used by the domestic consumer in the summer time for house cooling, and when it will be used for building cooling in the larger cities. We may confidently expect to see the store, the bank, the office building, and even the manufacturing plants cooled by gas in the summer, as well as heated by it in the winter. When that time comes, the domestic gas load factor will be greatly improved, and it might be possible for the gas companies to reduce their rates and thereby increase their markets.

A commissioner in one of our western states (while discussing a rate hearing) said that he did not understand natural gas very well, but as he understood it God made the gas, the people pay for it, and the gas company gets the money. As I have said before, that idea is prevalent due to the fact that the expenditures which have been made in the wells in the field are not apparent, the transmission pipe lines are buried out of sight, as is also the distributing system. The public does not appreciate the investment that is made, the expenditures which are necessary to maintain the lines and the distributing companies in a bottle-tight condition to supply his needs, the mining hazard incident to the business, and the necessity of building up an adequate reserve to last a number of years.

However, the American Public is fair minded and is willing that the gas company should have a fair return upon its property. It does not want something for nothing, and I have an abiding faith that the natural gas company which has thus fortified itself with an adequate supply of gas, and which gives satisfactory service to its customers at reasonable rates, will succeed.

Philadelphia Boosts Sales of Refrigerators

SALES of Electrolux, the gas refrigerator, in Philadelphia, the first half of this year increased 292 per cent as compared with the same period of last year, according to information received from the Philadelphia Gas Works Company. Total installations now number more than 3,000.

"Reorganization of the Refrigeration Sales Division" said C. R. Logan, chief supervisor, "last November, and the building up of faith in the product through employee education and advertising, gave an impetus to sales which has held steadily since the first of the year. Satisfied users have had a great bearing upon bringing about public acceptance."

204 Manufacturers Attend Annual Meeting

THE principal executives and representatives of more than 204 appliance manufacturing companies affiliated with the American Gas Association assembled in Detroit, Mich., September 17 and 18 for their first annual meeting. Under the policy of operation as established for this new divisional work, three meetings of various divisions within the new organization will be held each year, with one annual convention, for the purpose of giving the manufacturers a vehicle with which to consider and deal in common problems affecting the manufacturing industry.

In opening the first annual meeting of the Manufacturers' Section, Colonel E. S. Dickey, chairman of the section under whose administration this new work was placed in operation, confined his opening remarks to a review of the splendid cooperation that had been given him by the A. G. A. "Every request the Manufacturers' Section has made has been whole-heartedly met by the A. G. A. Board," he said. He predicted the delivery of results "far beyond our expectations, provided we exercise patience and tolerance and not expect that our new organization could possibly change conditions, which have existed for years, overnight."

Among the speakers heard on the first day were R. W. Gallagher, vice-president; Alexander Forward, managing director; Paul Ryan, statistician, and Philip O. Deitsch, under whose direction the new work is being carried on, Colonel Dickey, E. R. Acker, chairman of the Commercial Section, Hubert Tappan, general manager of the Glenwood Range Company, and Dr. Virgil Jordan, statistician, economist and editor of *Business Week*. Each speaker laid particular emphasis on the need of efficient organization among the gas appliance manufacturers. The officers of the A. G. A. present assured the full support of the Association to the new program promulgated by Mr. Deitsch and the Managing Committee of the Manufacturers' Section.

Dr. Virgil Jordan

The principal address of the morning session was delivered by Dr. Jordan. He said, in part: "I think that American business has had enough of reassuring speculations, promises and predictions. What it needs now is a perspective, a purpose and a plan. It has the intelligence and energy for reconstructive action, and it will recover when it recovers its confidence and creative courage.

"I deny that this depression is due to any inherent organic disease of our industrial system. What confronts us now is primarily a profound psychological disturbance, the cumulative effect of a widespread weakening of the sense of security in every class of our people.

"This has been due to fundamentally false financial philosophy, furthered by false fiscal policies, which have led to and are likely to intensify the unparalleled collapse of price levels unless they are altered by prompt emergency action.

"A trade association such as you are sponsoring, as evidenced by this meeting, is the one agency that can do more to restore American courage than any other single factor.

"We shall make little progress toward the restoration of stable prosperity until we face the fundamental fact that such depressions as this are due not to the deficiencies of our industrial system, but to the structural defects and flagrant mismanagement of our monetary system and credit institutions.

"Anyone who understands the real issues underlying this depression will realize that wage reductions will not be a contribution toward recovery."

W. F. Roberts
Chairman
Range Division

In the absence of Clifford E. Paige, president of the Association, Carl D. Jackson, counsel of the Association, read a prepared address from the president wherein he stated in part: "History tells us that business leaders of the past were convinced that their forefathers had had no such grave crisis with which to deal.

"As we delve further into the history of things we find that these insurmountable problems were mastered and that business had always enjoyed the very happy habit of reviving itself when conditions seem darkest."

Further Mr. Paige said: "I want to reaffirm the statement made by the chairman of your section, Colonel Dickey, at the organization meeting of the Range Division, which was held last May at White Sulphur Springs, W. Va. At that meeting he said in part: 'The American Gas Association, through its Executive Board is more and more recognizing the necessity of real cooperation between the industry and the appliance manufacturer. That is the spirit in which the Executive Board of the American Gas Association has authorized its Manufacturers' Section to arrange group organizations of the manufacturers. I want to say that these group organizations are to be entirely autonomous and self-controlled by the groups.'

"To that policy of the Association I thoroughly subscribe and wish you in your new work the abundant success which your program and your experience most certainly indicates that you deserve. . . ."

Mr. Gallagher, speaking of the need

H. G. Walker
Chairman
Water Heater
Division

for cooperation in the gas appliance manufacturing field, said: "Your Chairman, Colonel Dickey, combined in a few words recently, the entire truth of that thought when he said, 'Be certain of this fact—permanent progress always has been and always will be closely related to whole-hearted cooperation.'"

Mr. Gallagher continued: "Closer cooperation between utilities and the manufacturers in matters affecting gas service is highly desirable. . . . Referring to some of the details of your own organization plans, I note with pleasure that you have appointed committees among your various groups to eliminate unfair trade practices, to effect a plan of cross-licensing of patents, bring about the preparation of more accurate statistical information on gas appliance manufacturing activities and to offer general encouragement to the manufacturers of gas appliances. To me that program spells a new era in the gas appliance business. Your policies, so far as I know them, are sound and mark the initial step in the direction of a genuinely coordinated gas industry."

In his address Major Forward said: "We are now at the point of which we may say, as did a famous man of our Revolutionary period, 'Gentlemen, we must hang together or we will hang separately. . . .'

Frank Adams
Vice-Chairman
Space Heater
Division

"The Executive Board and the officers of the Association are strongly behind your efforts to accomplish something definite for the industry. I am sure Colonel Dickey, Mr. Kahn, Mr. Steinwedell and Mr. Deitsch have received every possible encouragement and assistance in their work.

"Do not get the impression that the organization of these group activities is a cure-all for our troubles. It is not offered as a specific remedy. We cannot take a dose or a series of doses of manufacturer trade association and get well. Trade association work is like the doctor's medicine, designed to assist nature, and its efficacy depends principally upon the cooperation of the patient. It is going to be as true in this job as in all the other relations of life, that we will get nothing out of it unless we put something into it.

"There are going to be lions in the pathway for a long time.

"I have lived long enough to see in several trades and professions an attitude of suspicion, distrust and secrecy changed to a spirit of mutual help, in which former trade secrets were freely imparted and business methods frankly discussed. Nor does it appear that those who have taken the Aesculapian oath have failed to reap honor and profit from their discoveries and their contributions to the general cause. . . . Nothing succeeds like success, and nothing cooperates like cooperation.

"Your new work must be done with patience. It must be done with frankness. It must be done with sincerity. It must be done through leadership. We have all these elements and I believe that we are going to succeed. There will be glory enough for all."

Mr. Deitsch's address was confined to a review of the progress attendant to the work of the group activities from March 19 to date. He made particular reference to the results that might be hoped for in the adoption of "Standards of Business Practice." He was emphatic in sounding a note of caution to the membership that they were not to expect this work to stand as a panacea for all of the present ills with which the manufacturing industry is beset. In that regard he said: "The contributory causes to profitless merchandising can be controlled by an industry to a limited extent through the adoption of, as one manufacturer put it, common sense standards of doing business.

"It must be remembered by our membership, however, that before permanent benefit is to result from the important work of our Standards of Practice Committee, there must first be created a real belief in the soundness of our movement. Mere talk about fair trade practices and failure to conform to them," he continued, "will mean nothing. Trade practice work, in order to be successful, must be met with a whole-hearted and sincere desire on the part of members of the industry to definitely place our respective houses in order, backed up by a genuine determination to keep them so, regardless of apparent momentary personal loss or advantage.

"It is the inherent right of every business to make a profit on the service or commodity it sells to the public. If such right does not exist, then there is no economic reason to justify the continuance of such a service or of such an enterprise. It is the defiance of this economic law by some manufacturers that is responsible in a great measure for the hundreds of business failures that are chalked up on the record of progress each year.

"Earnings can be increased, confidence restored, and competition conducted along enduring and sane lines just as soon as we show a lasting determination to tap the greatest reserve we have—cooperation."

A complete resume of the Detroit meeting, in printed form, will be distributed to the Manufacturers' Section. This report will contain in full all of the addresses of the principal speakers at the first day session.

On the second day session, separate meetings were held by the Range, Water Heater and Space Heater Division. These divisions received reports from their Cross Licensing of Patents, Standards of Practice and Safety Ordinance Committees. Because of the involved nature of their work, the Cross Licensing of Patents Committees were not ready to submit complete reports at this time. A progress report was, therefore, heard on this subject.

The Standards of Practice Committee of each division, however, had sufficiently completed their work to present their recommendations. Each division acted unanimously in an acceptance of the standards suggested by their committees and voiced their approval and appreciation for the work of those committees.

(Continued on page 517)

View of Impressive Exhi

This display of Gas Appliances, Equipment and Apparatus, Arranged by Manufacturer Company members of t ican

Exhi Staged at Convention

bers of th ican Gas Association, was the Center of Attraction at the Thirteenth Annual Meeting in Atlantic City last month.

What Is Ahead?*

By B. C. FORBES,
Editor "Forbes Magazine"

B. C. Forbes

IN your own industry, it seems to me, you have produced men possessing real courage. My hat is off, for example, to H. L. Doherty, particularly for some of the things he has done in the very recent past. Samuel Insull has accomplished wonders. Another man who absolutely, as many of you know, just radiates courage and enthusiasm and determination is good old Sidney Mitchell, and of course you will find Jack Miller, Southern California Edison, Hockembeimer, Pacific Gas. You will find those men have been going right straight ahead not letting the depressing conditions throw them into a state of hysteria.

I am supposed to talk of "What Is Ahead." I am glad your chairman called it "What Is Ahead" and not "What Lies Ahead." I was once given that topic, "What Lies Ahead," and I didn't like at all the way the toastmaster said it. He said, "Mr. Forbes will now address us. His subject being "What Lies Ahead," and he put terrible emphasis on the word Lies.

No human being can foretell what lies immediately ahead. Something will depend upon what occurs in Europe. Something will depend on what happens in Washington. A good deal will depend on whether our banking fraternity is able to muster up a little backbone. A good deal will depend perhaps most of all on you and me, whether we will have sense enough and confidence enough to go ahead living rationally and showing a little courage in making expenditures and in making investments at the absurd low prices now obtainable, but looking further, looking beyond the very nearby future, one can talk with absolute confidence concerning what will happen in this country. We will see the United States start once again on the upgrade.

Personally, I am not so sure that that start isn't being made under the surface at this moment. This upward movement we need have no doubt about it, will carry us farther, sounder and more solidly ahead than we ever have gone in the past. Some things should be done to hasten the advent of this upswing in business, in industry and in confidence.

Washington has made a start at last and let us hope will continue. The New York Stock Exchange, God only knows why, still persists in refusing to put an absolute ban on short selling. Short selling, as I at least have tried to analyze it, was invented and tolerated for the purpose of preventing unduly runaway markets in securities, commodities or anything else, but surely we have had enough deflation, involuntary deflation without permitting a lot of sheer mercenaries to continue betting millions and millions that this depression will go further. Surely we don't need short selling to prevent runaway markets at this moment.

So I, for one, positively refuse to become stampeded. I positively refuse to join the calamity chorus. It so happened that I was rather a lone voice in the wilderness during the latter part of 1929, doing my best to what James J. Hill once called "swinging red lights." It was very, very plain then that we were riding helter skelter for a fall. It is equally plain today that we have gone ridiculously and absurdly far in the opposite direction. There will be just as many fortunes made during this period of acute depression, just as many foundations laid as there ever was in 1914 or 1907 or any earlier period.

One word and one word only about your own industry. More and more as the man in the street becomes the boss of us all, more and more as public opinion becomes the supreme power of this democracy, more and more important is it to have the man in the street understand and appreciate what you are doing and trying to do. To quote old John D., he made what struck me as a very sage remark once. He said, "Next to doing the right thing the most important thing in the world is to let the public know that you are doing that thing." He himself learned that rather late in life, but, in golfing language, he has made a remarkable recovery.

Now as I see it, this industry, in addition to continuing to expand its pumping of gas, should address itself very seriously and earnestly and energetically to piping education. If you are wise you will make it your business to acquaint the man in the street, to acquaint the housewife also, with the A, B, C, economics of your business. You must explain to them in simple elementary language. You must dispel the notion of many people, particularly in regard to natural gas; it is there, you get it for nothing; it comes bubbling up; why should we consumers have to pay any exorbitant price for it?

Well, I say if you are to escape punishment, if you are to escape some of the woes and the troubles that, for example, our railroads have experienced in recent years because they in their heyday absolutely neglected to educate the public—the coal industry is another—I was going to say shining example, but I should say disgraceful example of an industry that failed to carry the public along with them.

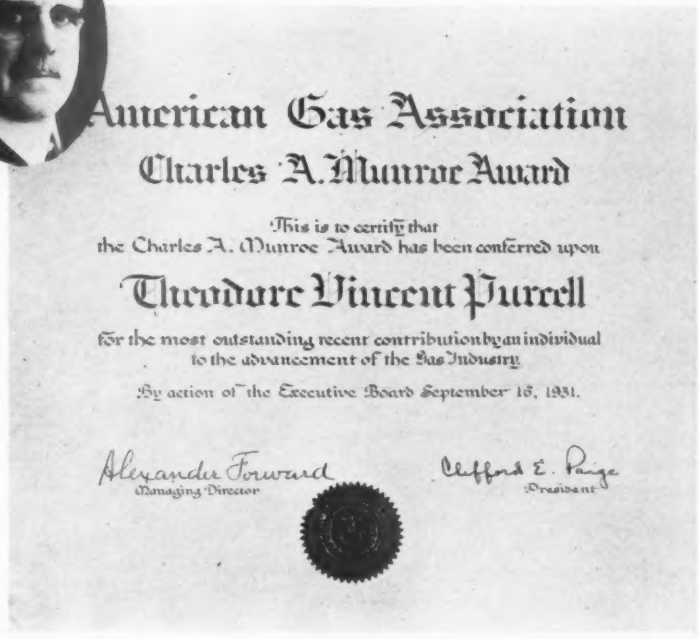
Now, I am sure that you men are doing a good straight, progressive, constructive job. I would also in common with the judge make exceptions of a number of promoters who are more interested in raking in ill-gotten gains than in rendering a service, but your industry, by-and-large, is doing an honest, straightforward, constructive job, reducing, helping to reduce costs which is in-

* Digest of address before General Session, A. G. A. Convention, Atlantic City, N. J., Oct. 15, 1931.

finitely important when we think of the struggle that is lying ahead in world markets.

You are helping to make America not only a more comfortable place to live in, but you are helping to make America more efficient in industry and business which is not unimportant, so in addition to doing your daily job and continuing to do it with the same spirit of courage and enlightenment that you are manifesting now, if you will take cognizance of this larger if perhaps intangible consideration and pay the price necessary in thought and in time and in money to get the public with you, then when the sons of jackasses get up in Congress and mouth all sorts of inflammatory nonsense they will be unable to start any serious trouble for you, and finally, after all, you yourselves will find that there is much more fun, much more satisfaction in your daily jobs if you have the knowledge that the public understand and appreciate and esteem the things that you are doing and doing for them.

T. V. Purcell Is Presented with Munroe Award



American Gas Association

Charles A. Munroe Award

This is to certify that
the Charles A. Munroe Award has been conferred upon

Theodore Vincent Purcell

for the most outstanding recent contribution by an individual
to the advancement of the Gas Industry

By action of the Executive Board September 15, 1931.

Alexander Forward
Managing Director

Clifford E. Paige
President

THEODORE V. PURCELL, vice-president of The Peoples Gas Light and Coke Company, Chicago, Ill., received one of the highest honors open to members of the gas industry when, at the convention of the American Gas Association, Atlantic City, N. J., October 14, he was presented with the Charles A. Munroe Award for pioneering and constructive leadership in rate making; for focusing attention upon gas sales development and crystallizing the gas industry's economic policies to this end. The award consists of an engrossed certificate and $500 in cash.

The presentation took place at the evening session of the Association at the Atlantic City Auditorium, attended by several thousand delegates and was made by Charles A. Munroe of New York, past president of the Association, who established this award.

The accomplishment which won the award for Mr. Purcell resulted from his studies in the development and application of business-getting gas rates; he has been prominently identified with the rate work of the Association since its organization.

Mr. Purcell was among the first men to recognize that rate making is one of the principal functions of gas company management, and he has been instrumental in securing general appreciation of the fact that the initiative in rate making must lie with the management and that, unless it exercises this office intelligently, and with full regard for the public, as well as the utility, it fails in one of its greatest duties.

Mr. Purcell's contributions in the form of rates, papers and addresses on the subject of rate making have been many and of great value to the industry. What he has said on this subject is a text to students of rate matters.

As chairman of the Committee on Domestic Load Survey through reports and addresses, Mr. Purcell has been instrumental in focusing the attention of the industry on the necessity of adopting comprehensive steps to conserve the present and increase the future sales of the industry in all of its branches.

Oklahoma Gas Wells Not Closed by Edict

A RECENT order of Governor William H. Murray, placing the Oklahoma City oil field under more strict military regulation, did not result in the shutting down of gas wells, which have been designated as such by the Oklahoma corporation commission. These wells are to be allowed to produce in order to supply gas distribution companies and furnish fuel for drilling wells.

Serves Gas Works More Than 55 Years

WILLIAM P. KNOWLES, superintendent of the Richmond (Va.) City Gas Works, has served that city for more than fifty-five years. On October 2, he entered upon his fifty-sixth year of service, although he has passed his eightieth birthday.

Gas— The Logical Fuel*

By MORSE DELL PLAIN,
President, Northern Indiana Public Service Company

TO all members of the gas industry whether they be utility men, appliance and equipment manufacturers or contractor-dealers, there should be reassurance and a pardonable satisfaction, if you please, in the stability that our industry has shown during the past two-year period.

This stability is clearly brought out by comparing the latest figures released by the statistical department of the American Gas Association with production figures in other industries as compiled by the United States Department of Commerce. Obviously we cannot with good grace dwell upon the misfortunes of our friends, but I think we may be pardoned for discussing some of our own good fortune.

Sales of manufactured and natural gas for the seven months' period ending July 31, 1931, declined less than 6½ per cent over the same period in 1930. The sales for the month of July, 1931, declined only 5½ per cent over July, 1930.

A further fact worthy of comment is that though the country as a whole showed a decline, there were some sections, notably the New England states, where conditions ran counter to the general trend and an actual gain over last year is shown. In the New England states July sales were up almost 3½ per cent over the corresponding month of 1930. While the Middle Atlantic states as a group registered a decline in sales, the New York state sales of manufactured gas for the month were nearly 2 per cent above the preceding year.

The domestic load fell least during the period under discussion. The domestic load for July, 1931, was less than 5 per cent under the figure for 1930, while commercial sales showed a drop of approximately 9 per cent, and industrial sales a drop of approximately 13 per cent.

The figures of other industries for the same period show that production of steel for July, 1931, declined 35 per cent below July a year ago. The July figure for the production of automobile passenger cars was 19 per cent under the figure for July, 1930. The production of processed foods fell 9 per cent between these two dates, and building construction this July was 14 per cent under the figure for last July. These figures have been selected at random from the latest issue of the Department of Commerce publication "Survey of Current Business," but they are typical of industry in general and indicate clearly how well the gas industry has maintained its position in comparison with other industries.

The gas business has shown itself to have, as Mr. B. J. Mullaney, Past President of the Association so ably expresses it, "an inherent stability and adaptability." The record made shows how well it can adapt itself to revised conditions and whereas we, as members of this industry, are to be congratulated on this accomplishment, I believe that the credit really belongs more to the character of the industry itself rather than to those of us who are fortunate enough to belong to or be associated with it. A general review of the part that gas is playing and can play in the American picture shows us that there is so much to be done that we have not done, that it would be sheer self-complacency on our part to assume full credit for our fortunate position. The time is not here, nor will be for quite some time yet, when we can sit back and bask in the glory of a job successfully completed. Before we can attain our final objective there is a long road to be built. Customer resistance has to be broken down, and the obstacles of competition have to be overcome before we can feel and know with certainty that gas has been accepted as the logical fuel for use universally in the thousands of ways for which it is ideally fitted.

It is true that economic conditions are not what they might be and that business conditions are not the most cheerful, but as Mr. Charles F. Kettering, Vice-President of General Motors, says in discussing this same question from a different approach:

> "American industry is at the cross roads. As a people we have to decide whether we are going to go on building America or whether we are merely going to operate it. In the past the twin jobs of building and operating the national producing plant and the transportation and distributing systems have utilized most of our men and resources. Are we going to drop back to the mere operation of the plant, or are we going to visualize new and greater industries ahead, and begin to plan and build for them?"

Applying this thought to the gas business, are we going to be content with what we have, or are we going to plan and organize to create bigger markets for our gas as a fuel either by developing new uses for it, or by capturing the business from competitive fuels? As business men our choice is obvious. We *choose* to progress, and progress lies in the successful promotion of the sale of gas for more and still more uses in the field of fuel. Sales promotion is the development of new markets, and it is in the sales promotional field therefore, that much of our problem of expansion lies.

The advent of natural gas in apparently unlimited quantities and also the rapidly increasing supplies of by-product gas have placed a very special responsibility upon our industry to secure the maximum distribution of our service and secure for the people of our communities the maximum benefit from this superior type of fuel.

A strong, aggressive sales policy—

* Delivered before General Session, A. G. A. Convention, Atlantic City, N. J., Oct. 14, 1931.

real salesmanship in the most complete sense of the word—was never so necessary as it is today. Some may say that this is not the time for pushing an aggressive sales policy; that money expended in such a way now is money wasted, but I cannot agree with them. The end of this dip in the business cycle will mean a different line-up of affairs. Whereas our customers and prospective customers may have more money, they will have learned during the lean days that every dollar has real value. It will not be possible to reach these people with the same appeal that we used in the boom days. We will have to show them that our service and our appliances are a definite asset in their lives.

With the adjustment of values in the public mind that we have had recently, with a rising competition from other forms of fuel, and with a great public buying power about to be turned loose, there is every reason why we should continue an aggressive sales policy if we have one, or adopt one at once if we do not.

The keen competition which we are meeting and will meet more and more, makes it essential that any sales program we adopt take into account every factor which will build up sales appeal or break down sales resistance.

A trained personnel will be able to impress upon the public consciousness, and the gas industry itself, the fact that gas is the logical fuel in home, store and factory. Employe training for customer contact is an essential factor in the continuation or adoption of an aggressive sales policy. Our employes must have a complete and accurate knowledge of the service they are helping to sell. Knowledge inspires confidence. They must know every good point possessed by gas and the advantages which it possesses over other fuels.

The sales department is one of the important cogs in our effort at better customer contacts. The additional effort in the training of our salesmen for public relations is more than justified. In this connection I wish to commend the work being done in the field of customer contacts by the American Gas Association. The committee of which Mr. A. J. Sarre is chairman is doing a fine bit of work in preparation for meeting the further requirements of our business. The current course on "Domestic Salesmanship" is a classic. In my company every domestic salesman was enrolled in the course and the comments we have heard from them are most enthusiastic. We extended the enrollment to the operating departments, to key men whose work is such that they could encourage sales through a sympathetic understanding of what we are trying to accomplish. The Industrial Sales Course is equally good, and those in our company who are studying the "Sales Administration and Management Course" are finding it to be of the greatest help in their administrative work. The American Gas Association has given a lead to the entire industry. May I suggest that those member companies who are not taking advantage of the courses are missing a real opportunity to strengthen their sales departments, and the personnel of their several other departments.

A full knowledge of every phase of our problem is, of course, important, but the necessity for enthusiasm in the task must be especially emphasized. Our entire organization must be enthusiastic and sales conscious. This can come only through the knowledge by the individuals of the principles of human relationship which in our business are the knowledge, confidence and enthusiasm that gas is the logical fuel of today and that tomorrow will open unlimited possibilities for its further expansion.

A sound dealer cooperation plan is a very vital factor in breaking down sales resistance. Briefly, sound dealer cooperation means to me making it more profitable to the dealer to sell and install gas appliances than those using other fuels. Sound dealer cooperation does not mean that the gas utility need go out of the merchandising business; as a matter of fact, generally speaking, the plumbing and heating dealers and contractors do not want us to stop merchandising, but they do want us, and I believe they have a right to expect us to so plan our selling policies as to provide that they shall receive for their goods and for their work satisfactory prices and meet only fair competition, while we secure what we are primarily interested in—proper volume and correct design. I shall not dwell longer on this subject as I understand it is to be covered from this platform by Mr. Oscar H. Fogg, Past President of this Association. Sufficient it is for me to add my confirmation to what we will probably bring out, that there are today many member companies who have developed dealer cooperation plans and the results are proving the soundness of the fundamental idea.

An adequate advertising campaign which features a liberal use of space in local newspapers is an important part of every aggressive sales program. Our story must be kept before the public continuously and the keener the competition, the oftener the story must be told and the more ingenuity must be used in presenting it.

The servicing of appliances presents another field through which our sales plans may be brought into more effective operation, and through which the efficiency, cleanliness, flexibility and quietness of gas as a fuel may be assured.

An intensive domestic load is responsible for the degree of stability which has so favored us as an industry. We must further build up and retain this stability by concentrating our sales energies on the domestic field. We will have gone far and accomplished much when we convince the American public that gas home heating is as necessary in their lives as the automobile.

There was once a time when self-starters on automobiles were considered a luxury. Who would think of trying to sell a car today without a self-starter? Gas is, logically and definitely, the home heating fuel of the future. We know it, but we must sell the idea to the general public.

Gas brings the maximum of home comfort with the minimum of human attention and is the most reliable and efficient source of heat known. In cooking, gas is without a peer as the logical fuel. Its speed, flexibility and perfect control are unequalled by any other fuel. Our position in the domestic cooking field is being consolidated, thanks to the enterprise of our

gas range manufacturers who have shown a most commendable ability in improving their products, both from a utility and an eye-appeal standpoint.

The self-action water heater is steadily taking the place in the American home which it merits. According to figures compiled by the Water Heater Committee of the Commercial Section and submitted at last year's convention, the self-action water heater business in units had increased approximately fourfold over the 1926 figures.

There are over 180,000 gas refrigerators in service today. Gas refrigeration is taking its place in our lives as the ideal way of preserving foods and doing all the things automatic refrigeration can do. The real joy of automatic refrigeration cannot be fully appreciated until the utter simplicity of gas refrigeration has been experienced.

In cooking, refrigeration, home heating, hot water heating, garage heating, incineration, and in the various operations of wash day, gas provides a fuel that will do the work swiftly, economically and most efficiently. Gas has become, without a doubt, the greatest servant to the fundamental needs of the home—a necessity of such magnitude that there can be no question that it is the logical fuel.

I have followed with much interest the experiments in home-cooling with gas being conducted by the A. G. A. this summer. In this alone there is a field that kindles the imagination. Are we not going to have in home-cooling just as in automatic refrigertion the very "magic" that will focus the eyes of the nation on our industry to our ultimate selling advantage? Gas as a home-cooling agent is as efficient and capable as gas as a heating agent. One of the developments of the very near future will be the installation of gas in the homes as an air conditioning and cooling agent for the summer months. This must come because it will make living conditions better and is another step forward in the evolution of the standard of living. Gas will be the leader in this development because it is the only known fuel which can furnish the quietness so essential in the home and combine with it reliability and low cost.

Industrial uses of gas present another opportunity for the expansion of gas service and in this field particularly does gas merit its appellation as the logical fuel. The manufacturer is coming more and more to see the solution of his heat problems in gas fuel. The marketing by the petroleum industry of some of its liquefied gases has brought into the industrial field a competition which may prove serious. It may very well be that our technical departments may find it desirable to develop a system whereby we, in the gas business, can make use of or distribute these liquefied gases as part of our regular service.

The expansion of gas into fields heretofore assumed to be exclusively electric makes it necessary for combination companies to formulate definite policies as to where they are to sell gas and where electricity. The average gas distribution system is underloaded. Furthermore, the recent development of long-distance, cross-country pipe lines has brought about the production and distribution of mixed gases having a much higher B.t.u. content. This has further increased the thermal capacity of these systems. These factors have resulted in gas companies finding themselves able to expand the gas load with little or no increased investment.

Any appliances using energy in the form of heat, and whose major consumption is during the non-home-heating season, makes an ideal appliance from the standpoint of the gas system. The gas refrigerator with its additional eleven or so therms per month, and its seasonable characteristics, is such an appliance. Practically all domestic fuel applications fall within this class and the combination company can logically allocate them to the gas system. Such loads can be added with little or no increased capital expenditure, and even perhaps at a lower unit operating cost as a result of the probably improved annual load factor.

Gas, like most faithful, dependable servants, lacks spectacular appeal, and therefore its promotion requires a more energetic and aggressive sales effort. A maximum of sales energy should be put into the sale of gas heating, gas refrigeration, and into the seeking of new ways to build up the gas load.

I do not wish to suggest that in the case of combination companies, the effort to secure additional electric load should be neglected, but I do suggest that the sales effort should be directed toward securing the maximum use of electricity for light and power—its logical application.

I am firmly convinced that for every dollar expended in sales effort, there is a greater return to both the consumer and to the combination company through a policy of promoting electricity in the light and power fields and promoting the use of gas as the logical fuel. "If it's done with heat, you can do it better with Gas."

No discussion of a gas utilities sales policy could be considered even approximately complete without a word about our rate structures. Here again the A. G. A. has done a notable work for the industry. Mr. F. L. Daily's Committee on Rate Fundamentals and the committee on Rate Structures, of which Mr. F. E. Newton is the present chairman, have both added very definitely to the tangible thought on this subject. I wish only to add a suggestion in the interest of the sales departments in the industry.

The gas business is not a complete monopoly and a fair return upon a fair value of the property cannot always govern the rates charged and still secure for us the maximum volume of desirable load. The industry can very properly give attention to its rate structures more with the idea of meeting competition than of paralleling costs. We will have to be fully alive to the fact that we have competition of a very definite kind from other fuels which are today being marketed at greatly reduced prices. We must be prepared to meet this competition with rates of a distinctly promotional type.

The credit for the progress which has been made in the past decade in gas rate policies must go largely to the sales-minded executives of the industry, and the point of view of the sales department should, in my opinion, be given major consideration in

(Continued on page 517)

Separate gas heater for wheel oven showing gas pressure regulating valve below

Gas Plays Big Part In Finishing Ford Cars

By J. B. NEALEY

DIFFERENT parts of Ford cars are manufactured at the Dearborn plant of the Ford Motor Company but they are assembled into the finished cars at the various assembly plants scattered throughout the United States. These are the last word in progressive, straight line assembly and the one located in New Orleans, La., exemplifies this to a degree. A spur track divides into a "Y" near one end of the plant, the two branches running along the two opposite sides of the building. The parts are unloaded on a concrete platform on one side, and the finished automobiles are loaded directly into the freight cars on the other side.

Starting at the unloading dock minor assembly lines terminate at points on the main assembly line where the various sub-assemblies are incorporated. A feature in this plant is the enameling line, included among the minor assembly lines and consisting of dip tanks and gas-fired ovens through which operate continuous traveling conveyors. This process is automatic and continuous in operation. The parts are hung on the charging end of the conveyor and removed at the discharge end with the enamel baked on and ready for service.

The first sub-assembly is the motor and the following operations are performed on the line:

Gear shift lever
Timer regulated
Spark plugs inserted
Fan and belt put on
Distributor
Lubricating system
Performance checked

Steering post assembly:
Wheel
Horn cable
Tube assembly

Radiator:
Paint sprayed on
Air dried
Testing

Wheel and tire assembly:
Tube protector tape
Tire
Tube
Inflation

The enameling unit consists of a washer, burnoff oven, sander, two dip tanks and two bake ovens for two coat work. The parts enameled include fenders, shields, aprons, hoods, running boards, brackets, etc. The washer is of box construction using plate steel, 4 by 6 feet in cross section and 55 feet in length. It is provided with a traveling slat type conveyor and tanks of soda solution and rinsing water heated to 800° F. by steam from a gas-fired boiler. The liquids are forced by pumps through spray jets onto the work as it passes through. The conveyor extends 5 feet beyond one end for use in loading.

The burnoff oven is used to remove the water and dry the work. It is almost identical in shape and size as the one described except that in the place of the tanks is a series of gas burners (six in number), which fire under the conveyor. These are of the gas-air proportioning type and the low-pressure system of firing is used. A temperature of 750° F. is automatically maintained in this oven with the use of a recording controller, connected with a motor operated valve in the air line. The combustible mixture is turned on and off intermittently and mechanically as the temperature varies either way from the degree set on the controller. Waste products of combustion are removed by a fan exhaust at each end. The conveyors

Gas-fired boilers which furnish steam for paint drying and other purposes

Operator receiving stock from delivery end of washer and passing it into the gas-fired burn-off oven where it is dried preparatory to being enameled

of both units are motor operated and the speed of the last so regulated that the work remains in the oven one hour.

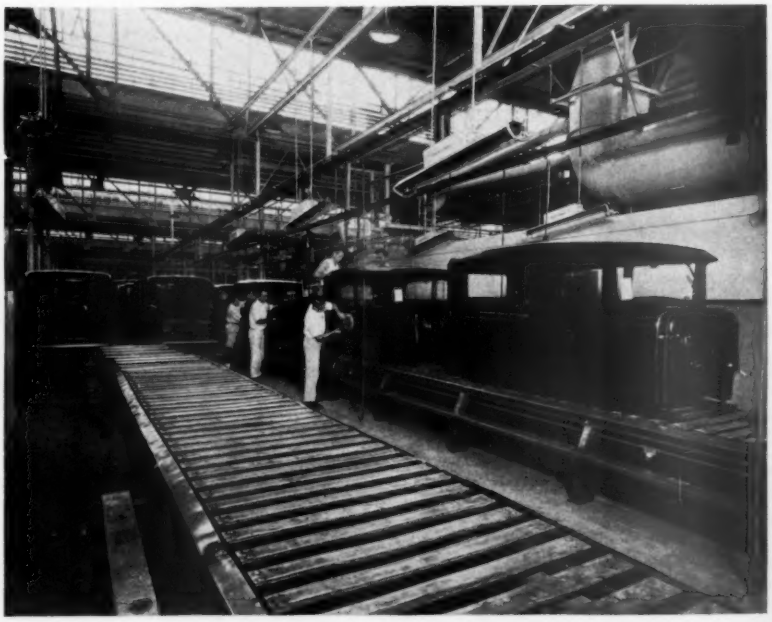
The parts then pass along on an open conveyor of the slat type and 43 feet long. Operators on each side of this mechanically operated conveyor, sand the surfaces of the parts in preparation for the enamel.

There are two enamel ovens, set side by side, and each is 110 feet long, 8 feet wide and 10 feet high. Each is equipped with an overhead chain loop conveyor, driven by a motor through a speed reduction mechanism. They are constructed of sheet steel held together with structural shapes and well insulated. There is a fan exhaust at each end. A dip tank at the loading end of each oven holds the liquid japan. An operator dips the parts and hangs them onto the conveyor of the first oven, through which they pass, and at the other end an operator removes them, dips them for the second coat and hangs them onto the conveyor of the second oven through which they also pass.

These ovens are heated indirectly, that is, air is heated in separate combustion chambers and forced into the ovens with fans. These heaters are each 16 feet long, 8 feet wide and 12 feet high and contain 20 tubes. A single gas burner fires into the chamber and the hot products of combustion pass between the tubes and out through a vent to a stack, imparting most of the heat to the air within the tubes. This hot air is forced by fan, through a filter and into the oven through a duct. Another duct with fan sucks the air from the oven and returns it to the heater to be reheated, and, in this way, recirculation and uniformity of heat distribution is obtained. Some fresh air from the atmosphere is pulled into this system and mixed as needed.

A unique feature of these ovens is that the charging ends are heated with steam coils, while the heat from the heaters is utilized in the remaining portions only. The reason for this is that too high a heat, applied just as the work comes out of the tanks, sets the japan before it has had a chance to drip and smooth out, leaving raised spots and streaks here and there. The low heat portion, where the steam coils are located, occupies not quite a fourth of the oven. The duct from the air heater enters at about the center of the oven and the heat is pulled toward the unloading end by the fan suction induced in the exhaust duct returning the spent hot air to the heater.

The temperatures in the low heat and high heat sections of the ovens are automatically controlled and separately. The steam supplied by the gas-fired boiler is maintained at a constant pressure at the boiler. The correct temperature in the high



Giving the finished painted bodies the final polish

heat portion of the oven is regulated by the amount of cold fresh air admitted into the recirculation system, and this in turn is controlled by a damper in the admitting flue. If the temperature of the oven should rise suddenly, or the current to the fan motors or conveyor motors fail, for any reason, a magnetic valve in the gas supply line immediately acts to shut off the gas to the burner. A temperature of 525° F. is employed for baking on japan or enamel, and the baking period is 1¾ hours.

The unit for japanning the wheels consists of a single diptank and oven. Here the operator simply transfers the wheels from the conveyor from the unloading dock, to the paint machines where they are dipped and spun by centrifugal force, placed on the oven conveyor and are then automatically moved through the oven. The oven conveyor is similar to the one already described and is motor driven through a speed reduction mechanism. This oven is similar in construction to those described but is 60 feet long and 10 feet square in cross section.

The wheel oven is also indirectly heated with a separate heater 6 feet by 8 feet by 8 feet high, and of the induced draft type, equipped with gas burners. Oven ventilation is furnished by means of a supply and an exhaust fan and a system of supply distribution and exhaust ducts, the fans being motor operated. This oven is also provided with a magnetic shut-off valve in case of sudden temperature rise or current failure. Fire protection for the tanks of japan consists of tanks of foamite, suspended overhead, and held in position with chains with fusible links at key points. Should fire occur the links melt and release the foamite which is sprayed directly onto the tanks. The japan is baked on at 320° F. for 1 hour and 20 minutes.

There are three main assembly lines, two for pleasure cars and one for trucks, and these extend nearly the entire length of the building, parallel to and on the side next the loading dock. Adjacent and parallel to these are several lines for assembly, painting and trimming of the bodies and on these are located 8 drying ovens. The paint spray booths are placed at the charging ends of these ovens; the paint is sprayed on the bodies and is dried as the bodies pass through the ovens. One of these lines is for colors and four spray booths in a row are used.

The ovens are of sheet steel, large enough for a body to pass through and range in length from 40 to 200 feet. Each is equipped with a motor-driven, slat-type conveyor and the first and second coat ovens are heated with steam coils. The temperature of the first coat oven is 225° F. and the bodies remain in the oven for two and a half hours, while the second coat requires only one and a half hours at 150° F. Drying in the other ovens is accomplished simply by circulating fresh air through them. The body parts are made at Dearborn but the bodies are put together here.

Steam for the various ovens, as well as for heating during the winter months, is supplied by two 100 horsepower boilers. Each of these is heated with two gas burners. The gas is at 60 lbs. pressure in the lines and this is reduced to 18 lbs. while at the burners it is still further reduced to approximately 2½ or 3 lbs.

Another interesting department is that for cutting and grinding glass and these operations are performed continuously in automatic machines. There are two 40-feet sections capable of finishing glass for 250 automobiles in 16 hours' operating time.

Beal Medal Is Awarded Philip T. Dashiell

P. T. Dashiell

IN recognition of the best paper on a technical subject presented at the 1930 convention of the American Gas Association, Philip Thornton Dashiell, engineer of works of The Philadelphia Gas Works Company, Philadelphia, Pa., was awarded the Beal Medal, at last month's convention of the Association, in Atlantic City. The presentation was made by T. R. Beal, president of the Central Hudson Gas and Electric Corporation, Poughkeepsie, whose family has donated this coveted award for years.

Mr. Dashiell won this distinction through his paper on "The Use of Heavy Fuel Oil in the Manufacture of Carburetted Water Gas," which was submitted last year before the Technical Section of the Association.

Mr. Dashiell, a native of Annapolis, Md., is a graduate mechanical engineer of the Sheffield Scientific School, Yale University, has been identified with properties of The United Gas Improvement Company since 1899, when he joined the United Gas Improvement Company as a cadet engineer.

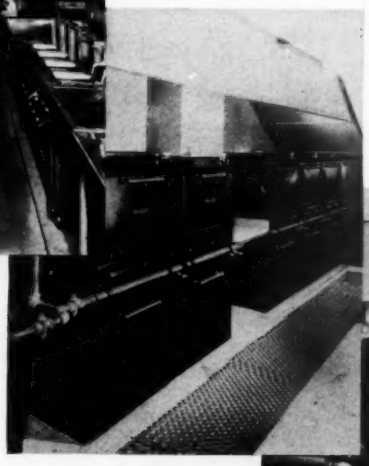
From that position he advanced steadily until 1928, when The Philadelphia Gas Works, which had been operating as a department of The United Gas Improvement Company became The Philadelphia Gas Works Company, and Mr. Dashiell was given the post of engineer of works.

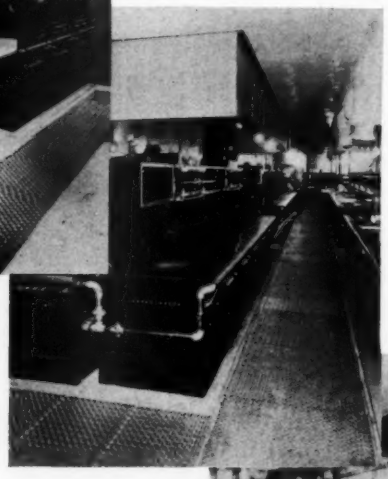
"A Barrel of Gas"

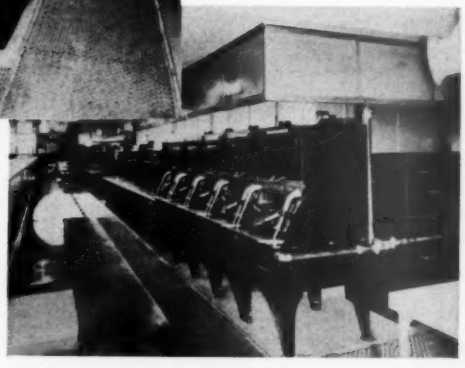
AS an aid to gas companies which wish to inform their consumers of the basic reasons for company merchandising of appliances, *Western Gas,* Los Angeles, Calif., has made available a series of brief pamphlets for company distribution to gas users. The first of the series, entitled "A Barrel of Gas" has just been released.

These pamphlets consist of brief messages, friendly and informal in tone, and illustrated by cartoons. The author of the text is James H. Collins, for twenty years a contributor to the *Saturday Evening Post, Country Gentleman,* and known to the utility industry as a writer in *Utilties Fortnightly.* Billy Cam, illustrator for Ring Lardner and Will Rogers features in Sunday supplements, supplies the cartoon sketches. The pamphlets are four-page (page size 3- by 5½-inch), and are designed for use as envelope stuffers, for counter distribution.

Waldorf-Astoria Installs 312 Lineal Feet Of Gas Appliances







A CITY within a city—the new Waldorf-Astoria Hotel on upper Park Avenue, New York, N. Y., formally opened on October 1. To the world at large, this was an important event because the Waldorf is the largest building of its kind in the world, but of particular interest to the gas man is the fact that when this luxurious hostelry was thrown open to the public, there was in place and ready for service 312 lineal feet of gas cooking appliances located in the five kitchens of the great building.

The Waldorf covers an entire city block, joined by 49th and 50th Streets, and Park and Lexington Avenues. It is regarded as the last word in architecture, construction and decorative skill. No expense was spared to make this house, both inside and out, a monument of merit to the hotel industry.

Its kitchens, situated in various parts of the building, are equipped with the latest designed gas burning appliances —a tribute to the gas industry, and one of which the industry should be proud. These gas cooking appliances in the kitchens include Vulcan gas ranges, broilers, roasting ovens, deep fat fryers, griddles, bakers' stoves and other miscellaneous gas equipment.

It is estimated that 10,000 people can be served from these kitchens at one time. The above illustrations show several of the kitchens and give some idea of the large amount of equipment necessary for the cooking needs of an establishment of this vast size and character.

Installation of gas cooking equipment in the new Waldorf again is proof that gas is the ideal fuel for cooking when it must be done quickly, economically and without interruption.

C. H. French, manager of the Hotel Equipment Division, Standard Gas Equipment Corp., of New York, assisted in the supervision of the installation of this enormous amount of gas equipment.

Oklahoma Cities Get Lower Rates

SEVERAL Oklahoma cities and towns secured lower gas rates during October, which were voluntarily put in force by the gas companies serving them. The Winchester Oil & Gas Company established a new top domestic rate of 55 cents per M cu.ft. applying to Woodward, Quinlan, Waynoka, Alva, Mooreland, Avard and Cherokee.

The Ponca City Gas Distributing Company voluntarily established a rate of 45 cents per M cu.ft. for the first 100,000 cu.ft., a reduction of 2 cents per M cu.ft. This reduction was approved by city officials of Ponca City, Newkirk and Kildare, which were affected by the new rates and also approved by the Oklahoma Corporation Commission. The rates are to be effective for only one year when former rates are to be automatically restored.

The Central States Power & Light Corporation announced voluntary rate reductions in Dill City, Lone Wolf, Sentinel, Bessie, Rocky, Erick, Elk City, Hobart, Clinton, Cordell and Wetumka. These reductions range from 5 to 15 cents per M cu.ft. on domestic gas.

Commercial Section

SAMUEL INSULL, Jr. Chairman J. W. WEST, Jr., Secretary WALTER C. BECKJORD, Vice-Chairman

Why Gas Refrigeration*

By H. S. CHRISTMAN,

Assistant General Sales Manager,
The Philadelphia Gas Works Co.

MANY of you here today can remember the A.G.A. Convention of 1926, held at Young's Million Dollar Pier. It was at that convention, five years ago, that gas refrigeration was first announced. Many of you will also recall our feelings as we tramped way out to the far end of that long pier, to gaze at the one lone refrigerator exhibited there.

We had heard rumors about a refrigerator that operated by gas. We knew it was theoretically possible to freeze ice with heat. But many of us were a little skeptical that the idea was a practical thing.

That was five years ago. And to my mind it marked the beginning of a new era for the gas industry, an era that is only today beginning to open up, and whose vast possibilities we are only now beginning to see.

It is so much easier to look back than to look ahead. Those of us who saw that first gas refrigerator five years ago, came away with an enthusiasm that was both genuine and spontaneous. Here was the long awaited Moses that was going to lead the gas industry out of the bulrushes. Here was an appliance so different, so advanced, that everyone certainly would rush to buy it, to the consternation of our friends in the electric industry, and with great profit to ourselves.

Why did not those first enthusiastic predictions come true? Why did not the Gas Refrigerator at once fulfill our expectations? Perhaps some of you gentlemen here were among those who got aboard the band wagon for a while, gave the thing a try, and then disappointedly let their interest wane. It's easy to see the reason now, looking back. The fault was not so much with the gas refrigerator as with ourselves.

The first two years in the life of any product are experimental years. Automobiles went through a trying period of confusion and adjustment. Aeroplanes went through it. So did radio. The wonder of it is that the Gas Refrigerator came through its teething days and reached maturity, half as quickly as it has. How many radio sets have you men bought and then had to discard between the time of the first one-tube crystal detector set, and the modern screen-grid dynamic speaker of today?

I think it would be interesting to outline briefly just how far along the road the Gas Refrigerator has come. You may not realize it. The real sales history of the Gas Refrigerator only begins in 1928, when the Consolidated Gas Company of New York succeeded in equipping two fine new apartment hotels of Henry Mandel Company with this refrigerator. Full-page color advertising in national magazines also began that year. So did newspaper advertising in cooperation with several local gas companies. Each year since then sales have increased by leaps and bounds. It may surprise you to know that today there are more than 200,000 gas refrigerators installed in this country. The world's largest apartment house, located in New York, with 1669 kitchens, is completely equipped. So is the largest apartment building in my own city of Philadelphia. Our sales of the gas refrigerator there for the first six months of this year were 192% ahead of last year. In New York I understand that their increase was also well over 100%, and that the sales record of Chicago, and Boston and other large cities is equally satisfactory. That accomplishment is certainly a far cry from the lone refrigerator we walked way out to the end of the pier to see, five years ago.

So much for the past.

It is not my purpose to stand here and sell you men on the Gas Refrigerator. Nor am I going to try to tell you how to sell it. You will find that subject admirably covered by your refrigeration committee in the A. G. A. Plan Book on Gas Refrigeration. What I hope to do is to point out where I think this great industry of ours is headed, and how the gas refrigerator can help us get there more quickly.

I think you'll agree that the gas refrigerator arrived at a most opportune time. Its coming was fortunate to say the least. It had been years since any new domestic gas appliance of any importance had been developed. The lighting load was definitely gone, lost for good. The cooking load was not materially increasing. The industry, in the eyes of the public, was not making great strides forward.

Meanwhile our friendly competitor, the electric industry, had forged steadily ahead, in both performance and prestige. Electric lighting had taken the place of gas lighting. Electric street cars replaced horse cars. Electric locomotives, electric cranes, electric elevators, electric battleships, had each replaced something less efficient. The home, too, had started to go "electric" so completely that the public had become convinced that an electric this or an electric that, no matter what, was just naturally better than the thing it replaced.

Can you blame the public for this tendency to accept anything electrical as the latest and most modern thing? Not only has the physical evidence of their eyes promoted the idea, but so have thousands of electrical appliance salesmen and so have millions of dollars been spent in magazine, newspaper and radio advertising.

Can you blame the public either, for its feeling that gas was a bit old-fashioned? They had not seen any striking new uses for gas come along. In fact, they had seen an important one disappear. The services that gas did perform were not impressed upon the minds every hour of the day. In fact, I think it is fair to say that compared with some of the many ingenious electric appliances on the market, gas appliances lacked drama and color. We know that there is actually just as much color and romance in the gas industry as in the electric industry. But we have needed some dramatic new appliance to attract public attention—some appliance that represented a radical advance over the old way of doing things.

The gas refrigerator, it seems to me, is a perfect answer. This appliance has a great dramatic appeal. The story of ice from heat, of freezing with a tiny gas flame, captures the imagination of the public. And the idea of producing perfect refrigeration without sound, without moving parts, and at less cost than ever before, is certainly such a radical advance that the old fashioned shoe is now squarely on the other foot.

Now for the first time we have something with which to meet the electrical industry on their own ground—and defeat them. In one large eastern city, for instance, the gas refrigerator today is actually outselling all other makes.

The significance of this goes much deeper than the sale of an appliance or increasing the load by so many cubic feet per month. By increasing the prestige of gas for its own use, the gas refrigerator has definitely increased the prestige of gas for all uses.

Gas is no longer an old-fashioned thing, something that people don't want or are afraid of. Gas is at last presented to the public in a way that makes it seem more modern, more desirable, than electricity.

People are gas minded today to an extent they never were five years ago and perhaps, never would have been, but for the fresh interest and impetus that the gas refrigerator has provided.

Whoever heard of an "all gas home" five years ago. There are hundreds of them in this country today. Only this year

* Address delivered before Commercial Section A.G.A. Convention, Atlantic City, N. J. Oct. 14, 1931.

over in Long Island one builder was putting in a development of 500 homes. It looked for a while as if they would be all-electric homes. Some smart sales work was done, with the result that the 500 homes today are all-gas homes—house heating, water heating, cooking and refrigeration. But the point I want to make is this: Without the gas refrigerator, the local gas company could not have offered a complete service and might certainly have lost the order for the other appliances. That is one instance where gas refrigeration saved the entire load. Most of you probably know many instances where it has saved at least the cooking load—especially in the modern apartment field where many builders like the stove and refrigerator either all gas or all electric.

Why Gas Refrigeration, I repeat? Why is my company so strongly interested in this new development? Thus far I have mentioned only reasons that bear upon our future and upon other phases of our business. I've said nothing about the very substantial dollars-and-cents value that we find in gas refrigeration itself, right today.

Make no mistake that the gas refrigerator can be sold, installed and serviced at a profit. We are doing that very thing right now. And the profit is a double one. First upon the appliance, secondly upon the load.

Also make no mistake about the value of that load to any gas company. It is relatively small per unit, but that's not the important thing.

The vital point is that the possibilities of selling gas refrigeration are limitless. In looking ahead to see where load increases are to come from during the next five years, gas refrigeration should be counted for its share. One of the executives of a prominent eastern gas company pointed this out at a regional sales conference this summer. He said: "House heating, water heaters, incinerators, clothes dryers—these are good load builders. But they are sold mainly to owners of individual homes. And they take a lot of selling. Refrigerators, on the other hand, are like gas ranges. They can be sold to both apartments and home owners."

Every woman would like to own an automatic refrigerator. Nearly every woman secretly hopes and expects to have one in her home some day. The desire for this type of appliance, thanks to long years of advertising, is much stronger than any desire for the other appliances I have mentioned. Furthermore, it is not only the wealthy people who are buying automatic refrigerators today. That was true a few years ago. But people of lesser incomes are just as live prospects now as the folks who live on Main Street. Perhaps more so, for they probably haven't been hit as hard in the stock market. If you want proof of this, all you have to do is look at the recent sales figures of the leading automatic refrigerator manufacturers. Their industry is one of the notable exceptions which have felt no depression this year.

So I repeat, gas refrigeration can be sold. The market is there to an extent so huge that it makes any consideration, such as the amount of load per appliance, seem absolutely unimportant.

It is a load too, that has ideal characteristics, with little variation through the entire 24 hours.

Nor does it require any additional outlay in the way of new facilities or increased overhead. Each refrigerator added to the line is just so much velvet from that standpoint. It is profitable load, because it often means the difference between serving small customers at a loss and serving them at a profit.

Please don't get the idea from my enthusiasm that all you have to do is put the Gas Refrigerator on your showroom floor, announce it to the public and then sit back and watch your sales and your send-out rise in unison. It takes a lot of sound planning and good hard serious effort to sell anything in a big way today. This is particularly true in a highly competitive field like automatic refrigerators. Spasmodic or haphazard effort will not do at all. I touch this phase of the subject lightly, for as I said before, my interest today is in pointing out an opportunity. The how and the why and the wherefore is another subject, and if you are interested in that I know you can get far better information from the manufacturers than from me, because they are in a position to give you the cumulative wisdom and experience of many gas companies along that line. Suffice to say that if you happen to be one of those who had early experience with gas refrigeration and let your enthusiasm wane, or if you have had no experience with it at all, then you are due for a pleasant surprise. For the gas refrigerator today is definitely over its growing pains. The product, the sales methods and policies, the manufacturer's cooperation, the advertising, the service problem—these things have ripened and matured until today their calibre is as high as you will find anywhere in the refrigeration field. Take the one item of service calls, for instance. The record of the gas refrigerator in this one respect always did compare well with any of its competitors. Yet its record has steadily grown better in the past three years. And the more boxes that go out, the lower does the percentage of service calls drop.

I mentioned gas refrigerator advertising. That brings up another point we have learned, and I think there is a lesson in this for the entire gas industry. You know of the millions of dollars of advertising that the electric industry is spending right now to promote the idea of electric refrigeration. We have less money to spend than our worthy competitors. We have fewer salesmen on the job, and a later start by several years. So it is vitally important that we get 100 cents worth of value from every dollar of effort. What we have learned is the value of cooperation. Instead of preparing our own advertising along the line of our own ideas, we work closely with the manufacturer on gas refrigeration. By making the same sales points, by saying the same things in practically the same way, and keeping a family likeness in the physical appearance of the advertising, we tie up with the manufacturers' national advertising and make it work doubly for us. This also applies to our window displays, our direct-mail work and other promotional efforts. It strikes me that this idea of cooperation, of everybody working for the same end, has been carried much further in the electrical industry than our own, and that we might well apply the principal to appliances other than the gas refrigerator—to water heaters, house heaters, ranges, etc. I don't mean cooperate with the manufacturers alone, but with each other, as well. Why shouldn't gas companies in the same trading area campaign the same products in the same way at the same time, and make every dollar work twice as hard? Five little campaigns may be absolutely lost individually, but pool the five together, make one big campaign, and you've got something that is impressive.

The gas industry has had a wonderful past. I firmly believe it has a far more wonderful future ahead. That may seem a rash prediction in the midst of these dark days right now. But this belief is based upon past experience. Look back over the past ten years and what do you find? The birth of many marvelous new inventions and ideas. What helped these ideas to be born? The depression of 1921. Adversity somehow seems to sharpen our wits and our ingenuity. This nation thrives on a fight against odds. It came into being as the result of such a fight. We grew as our forefathers fought their way westward against trackless wilderness. We are a fighting nation, and I don't mean in a military sense so much as in an economic way.

Out of the depression of 1921 came the tremendous rise of the radio, the stupendous growth of talking pictures, the spread of commercial airlines, the beginning of television.

I believe that we, the gas industry, are on the threshold of great and glorious things in the decade to come, and that the gas refrigerator, with its tiny gas flame, will help us light the way to that future. The surface has merely been scratched in the field of automatic refrigeration. And there are other developments in sight, which the gas refrigerator is going to hasten—air conditioning for the home, for instance. A thing of such tremendous possibilities for the gas industry that it staggers the imagination, yet something that is bound to come, and probably sooner than any of us expect. Within our own time we will sit in our homes on a hot sultry night, every window closed, yet surrounded by clean, cool air. On a cold winter night, we'll also be perfectly comfortable, in the midst of warm filtered air that is neither too hot nor too dry. And the marvel that will both cool the air in summer and warm it in winter will be gas.

Technical Section

I. K. PECK, Chairman H. W. HARTMAN, Secretary K. H. CREE, Asst. Secty. J. A. PERRY, Vice-Chairman

Gas Mixtures—Their Selection, Utilization and Distribution*

By J. A. PERRY,

The United Gas Improvement Company, Philadelphia, Pa.

BLENDING gases to meet our requirements is today an important problem. A correct solution for each particular situation is a measure of our abilities to accept and to use those materials which will give the most economical as well as the most satisfactory service to our customers.

The available materials include coal, coke, oil, natural and other hydrocarbon gases.

Coal gas, carburetted water gas and natural gas have all been used but in the past the locality of production and the limits imposed by transportation facilities confined the use of certain materials to a more or less definite area.

Developments in transportation facilities and refinements in and growth of the petroleum industry have greatly modified conditions.

Improvements in pipe lines and pumping equipment and the development of large reserves have multiplied the economical distance for the transportation of natural gas. The search and continued drilling for oil has greatly increased the immediate and future quantity of natural gas available. These developments free natural gas for use in many new locations.

The ever growing demand for gasoline both in total quantity and in relation to other petroleum products, as well as the increased production of crude oil, has made new oils available to the gas industry and has modified and greatly cheapened the oils formerly used for gas making.

Refinements in the petroleum industry have made the hydrocarbon gases, propane and butane, as well as refinery oil gas, available for many situations.

The large use of coke for domestic and industrial purposes has made it economical to produce and to use large quantities of coke oven gas.

If the entire supply is to be made of any one particular gas the problem is simply one of selection. Usually, however, two or more gases should be used and it is necessary to blend them in such a way that satisfactory appliance performance may be anticipated under any and all load conditions.

The work done at the American Gas Association Laboratory for the Mixed Gas Research Committee has shown that there are three factors which govern the variations permitted if the gas utilization appliances are to perform in a satisfactory manner.

Quoting from various reports these factors and their influence are:

(a) Heating value.
(b) Specific gravity.
(c) Chemical composition.

A change in heating value per cu.ft. affects the B.t.u.'s delivered through the burner. The air required for combustion is almost proportional to the heat units delivered in the gas. An increase in heating value of the gas above that of the adjustment gas will tend toward soft flames and possibly incomplete combustion and a decrease in the heating value of the gas will tend toward hard flames and possibly flashbacks.

Since the flow of two gases through an orifice is inversely proportional to the square root of the gravities of the gases, an increase in gravity will mean a decrease in flow through the orifice. The primary air entrained is proportional to the momentum of the gas stream and therefore for the same pressures and same gas orifice remains relatively constant. This means that an increase in specific gravity will tend toward harder flames and possibly flashbacks and a decrease in gravity will tend toward softer flames and possibly incomplete combustion.

The chemical composition of the gas will also affect its flame characteristics. Hydrogen is much faster burning than any of the other gases. Methane and ethane, for instance, are slow burning. The illuminants and carbon monoxide occupy a position between the paraffines and hydrogen, being closer to the paraffines in their rate of flame propagation. Other things being equal, a gas containing a large amount of hydrogen such as blue gas or coal gas will be fast burning while a gas low in hydrogen or high in methane, such as natural gas, will be slow burning.

Certain gases are inherently more suitable for base gas than for peak gas, notably coal gas, by virtue of the character of the production equipment, and natural gas, by virtue of the limit in transportation facilities. Other gases are comparatively more suitable for peak production, notably blue gas, carburetted water gas, oil gas, butane or butane enriched gases.

The base gases in normal use are coal gas, carburetted water gas, oil gas, reformed gas, natural gas, or mixtures of natural gas with either blue gas, carburetted water gas or coal gas.

The peak gases are normally blue gas, carburetted water gas, oil gas, butane or butane enriched gas.

The selection of a base gas involves a study of the cost of materials and the cost of converting these materials into a gas suitable for distribution.

The same factors affect the selection of a peak gas. Now it may be that the most economical base gas considered solely from a production standpoint cannot be used since it is of a character such that the peak gas necessary would be too costly and conversely the most economical peak gas from a production standpoint may be entirely unsuitable for mixing with the gas to be augmented. We must, therefore, study out and select the most economical from the workable combinations for the base and peak gases.

Generally speaking, base gases may require high investment costs but should demand low material and conversion costs per M cu.ft. Peak gases should require low investment costs but may demand high material and conversion costs per M cu.ft. The ratio of these costs varies with almost every situation, depending not only upon the investment cost, the materials and conversion costs, but also upon the character of the load and its effect on the amount of peak gas produced.

The problem of actually mixing gases after they are produced has been satisfactorily solved by several equipment manufacturers.

The problem of selecting and proportioning the use of various kinds of gases is a separate problem to be solved for almost every particular situation. Once certain tentative conclusions have been reached, actual tests of the various base, peak and other mixtures should be tried out on the various appliances in general use for that particular situation and then the proposed mixtures should be further modified to secure the best all around operating and utilization results.

I shall not, therefore, endeavor to do more than to point out the few fundamental ways in which we may modify for a few particular cases.

You will note in the attached Table No. 1 a list of the various gases commonly available for mixing. The problem in the past was rather simple—the load permitted either coal or carburetted water gas to be the selection, depending upon local economic conditions.

* Delivered before the Technical Section, A. G. A. Convention, Atlantic City, N. J., Oct. 15, 1931.

During recent years the development of the various heating loads, house heating, water heating, industrial, etc., has resulted in increasing maximum day sendouts. In some instances the maximum day may be in excess of three times the average summer day sendout. With coal gas for the base load equal to the average summer day sendout, it is now necessary not only to thoroughly mix the coal and carburetted water gas but to find out what, if anything, can be done to modify these mixtures to better suit our requirements. With our 530 B.t.u. and lower heating quality standards, we can greatly improve conditions by using as much producer gas as possible with the coal gas for increasing its gravity during the summer season. Other modifications have been developed as shown in the following problems:

Problem A. Given a coal gas base at 530 B.t.u. or lower, equivalent to the average summer day sendout and with extreme peak load three to four times this average summer day. What modifications can be made to improve the mixtures?

(1) The gravity of the coal gas base can be kept relatively high during the low sendout season by

(a) The addition of producer gas, or

(b) The addition of blow run blue or carburetted water gas.

(2) As the load develops, increase the use of carburetted water gas, reduce progressively and finally omit the producer and blow run gases.

(3) During extreme peak day sendouts.

(a) Operate some or all carburetted water gas sets to produce a gas of lower gravity than normal.

(b) Operate all carburetted water gas sets to produce a higher B.t.u. quality than the standard.

Large quantities of natural gas and refinery oil gas are becoming available for use in combination with manufactured gas. Usually not sufficient of either or both of these gases is available for straight distribution, or for enrichment of blue water gas for the entire peak load sendout. Some coal gas may or may not be available for the base load. Where natural and refinery oil gases are available they may be utilized in several ways but primarily for enrichment purposes.

We may consider the simple problem:

B. Present gas all the year round is carburetted water gas of 530 B.t.u. quality and about .66 gravity. Natural gas becomes available for enrichment.

(1) For base load conditions, operate the carburetted water gas plant with some blow run for blue gas production and use the natural gas for enrichment.

(2) For greater loads including peaks, use natural gas for part enrichment on top of carburetted water gas with reduced blow run to stretch out the peak demands. Keep the mixtures and gravities within the limits found by tests to be satisfactory.

B_1. Present gas mixture is coal and carburetted water ranging from .55 gravity to .61 gravity. Natural gas becomes available for enrichment; coal gas plant to be shut down.

(1) Operate the carburetted water gas plant as a blue gas plant using natural gas for enrichment. Determine what blow run, if any, can be used and if appliances must be readjusted.

(2) If there is a surplus of natural gas available for summer use, consider and test out possible use of a combined reformed blue and producer gas enriched with natural gas.

(3) Use natural gas for part enrichment on top of carburetted water gas to stretch out for the peak to the full extent that natural gas may be available.

B_2. Same as B_1 except refinery oil gas becomes available for enrichment.

(1) Operate carburetted water gas as a blue gas plant, use refinery oil gas for straight enrichment.

(2) If refinery gas is available in large quantities, determine amount of oil gas that can be used for reforming, or

(3) Re-adjust appliances to a lower gravity gas to be selected and use a combined reformed-blue gas-blow run on base enriching with refinery oil gas.

B_3. Same as B_1 except refinery oil gas rather than natural gas becomes available for enrichment.

(1) Use blue gas made on carburetted water gas sets and enrich with refinery oil gas. Determine by test what re-adjustment of appliances is necessary.

(2) If refinery oil gas is available in large quantities consider the reforming of some refinery oil gas. This may obviate the necessity of making a general re-adjustment of appliances.

(3) For extreme peaks stretch out with refinery oil gas for enrichment on top of carburetted water gas, reforming some refinery gas to the extent shown by tests as desirable to keep the gravity of the mixed gas within the required limits.

It may seem to those who have not studied the problem seriously that so much care is not necessary in testing out just what can be done say on present adjustments of appliances, or on some re-adjustment using a different or modified base gas.

Perhaps some of the variations can be made clearer by showing the variations in the quick burning gases and the changes in gravities. Take, for instance, Problem "C," a 600 B.t.u. carburetted water gas base as normally produced of..... .68 gravity. If we substitute natural gas for enrichment using a normal blue gas for the base the gravity is reduced to..... .62 and at the same time the quick burning hydrogen gas will be decreased by 10%. It will be found that the flames will be too soft without a re-adjustment of the appliances. The natural thing to do then is to determine the modifications that can be made in the base blue gas and the extent to which natural gas can be used as a partial enricher without re-adjustment of appliances, and whether or not this modified operation will be as economical and satisfactory as re-adjustment with a larger use of natural gas for enrichment on the base load operation. Then too consideration must be given to the top limit of natural gas for peak load use. For instance, if a re-adjustment were made on a .62 gravity blue and natural gas mixture, would operations be satisfactory on a partial enrichment and gravities running up to .66? If the natural gas failed, could the original carburetted water gas of .68 gravity and 10% more hydrogen be satisfactorily utilized by the appliances now in adjustment for the .62 gravity blue and natural gas?

I will mention one more problem as indicating the trend in some of the larger cities. Larger supplies of natural gas and of refinery oil gas are available. Larger amounts of coal or coke oven gas must be used for the base or summer load.

The plants and conditions may be such that all of the various gases cannot be brought to a central point for mixing.

The appliances in service, designed for use with manufactured gas, will not tolerate too high a B.t.u. standard without an extensive replacement of appliance burners. What is this B.t.u. limit? Tests seem to indicate that it is about 700 to 750 B.t.u., but different conditions may cause some variation from this limit.

Let us assume that a 700 B.t.u. standard is tentatively selected for distribution.

Problem D. Coal gas of about Analysis 4, Table No. 1, is available for summer and winter use in about a constant quantity. Large supplies of natural gas, Analysis 14, of Table No. 1 and of refinery oil gas, Analysis 12, Table No. 1, are available for enriching. Producer gas, Analysis 1, blue gas, Analysis 2 and 3, and carburetted water gas, Analysis 6, Table No. 1, are available from the water gas plant for modification and for mixing.

(a) Is the standard selected for the mixed gas likely to be most satisfactory for the situation as a whole, keeping in mind that the present appliances are the type designed for manufactured gas of 530 to 600 B.t.u.?

(b) What base gases or mixtures may be used to the best advantage for the summer load? Assume that the plant conditions are such that the natural and refinery oil gases may not be available at common locations.

(c) Can the load be satisfactorily augmented with an increased use of natural and

Table No. 1
GASES COMMONLY AVAILABLE

Component Gases	CO	H_2	CH_4	C_2H_6	Ills.	CO_2	O_2	N_2	Blue Gases	Hydro-carbons	Inerts	B.t.u.	Sp.Gr.
1. Producer Gas	25.3	13.2	0.4	——	——	5.4	0.5	55.2	38.5	0.4	61.1	129	.878
2. Blue Gas	38.3	52.8	0.4	——	——	5.5	0.M	2.9	91.1	0.4	8.5	295	.521
3. 250 B.t.u. Blue Gas	34.8	42.0	0.4	——	——	5.5	0.2	17.1	76.8	0.4	22.8	250	.618
4. Coal Gas	5.9	53.2	29.6	——	2.7	1.4	0.7	6.5	59.1	32.3	8.6	548	.375
5. Coal Gas-Producer Gas	7.3	51.3	26.6	——	3.2	2.1	0.9	8.6	58.6	29.8	11.6	527	.431
6. Carb. Water Gas No Blow Run	32.6	38.2	8.0	2.2	8.6	3.4	0.5	6.5	70.8	18.8	10.4	530	.643
7. Carb. Water Gas With Blow Run	24.1	32.5	9.0	2.2	10.3	4.6	0.6	16.7	56.6	21.5	21.9	530	.703
8. Carb. Water Gas Low Gravity	21.9	49.6	10.9	2.5	6.1	3.6	0.4	5.0	71.5	19.5	9.0	536	.539
9. Carb. Water Gas No Blow Run	25.7	32.6	8.6	7.2	13.1	6.1	0.6	6.1	58.3	28.9	12.8	603	.675
10. Reformed Gas Refinery	14.3	50.9	15.9	5.0	2.4	2.2	0.9	8.4	65.2	23.3	11.5	530	.497
11. Reformed Gas Natural	14.5	43.5	29.7	1.7	1.0	2.4	0.2	7.0	58.0	32.4	9.6	530	.472
12. Refinery Gas High Paraffine	1.2	6.1	4.4	72.5	15.0	——	0.2	0.6	7.3	91.9	0.8	1644	.990
13. Refinery Gas High Olefine	1.2	13.1	23.3	21.7	39.6	0.1	1.0	——	14.3	84.6	1.1	1468	.890
14. Natural Gas	——	——	78.8	14.0	——	0.4	——	6.8	——	92.8	7.2	1013	.635
15. Natural Gas	——	——	82.8	16.3	0.8	0.1	——	——	——	99.9	0.1	1145	.650
16. Butane—Commercial										100.0		3200	1.950
17. Propane—Commercial										100.0		2550	1.523

refinery oil if these gases are to be mixed with coal and carburetted water gas?

Standard of Quality (a). Assume that the original decision to distribute 700 B.t.u. is sustained by appliance tests, a higher quality not being justified due to the extensive appliance changes required.

Base Gas Mixtures (b)—700 B.t.u. Gas.

I. Top the coal gas, Analysis 4, Table No. 1, with natural gas, Analysis 14, Table No. 1, to 700 B.t.u. The mixture shown in Analysis 1, Table No. 2, will contain about 67% coal gas and 33% natural gas and be of about..... .46 sp.gr.

II. For modifying "I" use the producer gas shown in Analysis 1, Table No. 1. A gas containing 39% coal gas, 15% producer gas and 46% natural gas, as shown in Analysis 3, Table No. 2, might be obtained of about..... .57 sp.gr.

III. For modifying "I" use the 250 B.t.u. blue gas, Analysis 3, Table No. 1. A gas containing 39% coal gas, 17% blue gas and 44% natural gas as shown in Analysis 4, Table No. 2, might be obtained of about ..... .53 sp.gr.

IV. Top the coal gas, Analysis 4, Table No. 1, with refinery oil gas, Analysis 12, Table No. 1, to 700 B.t.u. This mixture shown in Analysis 2, Table No. 2, will contain 86% coal gas and 14% refinery oil gas and be of about..... .46 sp.gr.

V. For modifying "IV" use the producer gas shown in Analysis 1, Table No. 1. A gas containing about 65% coal gas, 15% producer gas and 20% refinery oil gas, as shown in Analysis 5, Table No. 2, might be obtained of about..... .57 sp.gr.

Peak load mixtures (c) 700 B.t.u. quality.

VI. The peak load gas produced at one plant might be 15% coal gas, 35% natural gas and 50% carburetted water gas as shown in Anaylsis 6, Table No. 2 of about ..... .60 sp.gr.

VII. The peak load gas producer at the other plant might be 10% coal gas, 15% refinery oil gas and 75% carburetted water gas as shown in Analysis 7, Table No. 2, of about..... .67 sp.gr.

Selection of Base Gas

When we have determined that gases such as Analysis 6 and 7 of Table No. 2 will be the peak gases, we can then select the base gases which will be most satisfactory.

The simple mixture of coal gas and natural or refinery oil gas shown in Analysis 1 and 2, Table No. 2, will obviously be unsatisfactory. The variation in gravity from .46 to .67 or 45% is entirely beyond the allowance of satisfactory burner performance and while the hydrogen is comparatively high in these gases the hydrocarbons are also high; there is insufficient change in chemical composition to compensate for extreme change in gravity. These base gases, No. I and No. II, Table No. 2, may then be eliminated as unsatisfactory.

Now examining Gas No. III, Table No. 2, we see that the gravity range, .57 to .67 or 17.5%, is within the normal allowance of satisfactory burner performance, the hydrogen content of 22.7%, together with the high inerts and methane, would tend toward a slow burning gas which might also blow to some extent.

The blue coal natural gas mixture of Analysis 4, Table No. 2, offers more promise. While the specific gravity variation of .53 to .67 or 26% is rather high it is not greatly in excess of that of gas III. The increased amount of hydrogen in this gas IV over gas III and the decrease in inerts will aid in obtaining a fast burning flame. We would conclude, bearing in mind some tests with which we are familiar, that gas IV would be more satisfactory than gas III.

The coal gas, refinery oil gas, producer gas shown in Analysis 5, Table No. 2 of .57 specific gravity will obviously be satisfactory for a base gas since the gravity variation is not excessive and the changes in chemical composition between this and the peak gases are not excessive.

We would then select gases IV and V for base gases, as the load increased the blue or producer gas used for modification would be replaced first by better quality blue gas, then by gradually increasing quality carburetted water gas until the gases shown in Analysis 6 and 7, Table No. 2, were finally produced as extreme peak gases.

Having selected these four gases for trial we would check our conclusions regarding appliance performance in the laboratory. We would endeavor to use such appliances for testing as most nearly represent those in service in the territory. Any slight changes to the proposed base or extreme peak gas which might be advisable would be emphasized in these laboratory tests so that better base and peak gases would be chosen and we would know the practical limits within which we could operate our plants before any changes were made.

Table No. 2
PROBLEM "D"—BASE AND PEAK GASES, 700 B.t.u. STANDARD

Component Gases	CO	H_2	CH_4	C_2H_6	Ills.	CO_2	O_2	N_2	Blue Gases	Hydro-carbons	Inerts	B.t.u.	Sp.Gr.
Mixtures of Base Gases													
1—Coal Gas & Natural Gas	4.0	35.8	45.7	4.6	1.8	1.1	0.4	6.6	39.8	52.1	8.1	700	.460
2—Coal Gas & Refinery Oil Gas	5.2	46.7	26.1	10.1	4.4	1.2	0.6	5.7	51.9	40.6	7.5	700	.460
Selected Mixtures for Base Load													
3—Coal Gas, Producer Gas and Natural Gas	6.1	22.7	47.9	6.5	1.1	1.5	0.3	13.9	28.8	55.5	15.7	700	.570
4—Coal Gas, 250 B.t.u. Blue Gas and Natural Gas	8.3	28.0	46.1	6.1	1.1	1.7	0.3	8.4	36.3	53.3	10.4	700	.530
5—Coal Gas, Producer Gas and Refinery Oil Gas	7.9	38.0	20.3	14.2	4.7	1.7	0.6	12.6	45.9	39.2	14.9	700	.570
Peak Gases													
6—Coal Gas, Natural Gas and Carb. Water Gas	17.2	27.1	36.0	6.0	4.7	2.1	0.3	6.6	44.3	46.7	9.0	700	.600
7—Coal Gas, Refinery Oil Gas and Carb. Water Gas	25.2	34.9	9.6	12.5	9.0	2.7	0.5	5.6	60.1	31.1	8.8	700	.668

Industrial Gas Section

A. J. PETERS, Chairman — C. W. BERGHORN, Secretary — W. F. MILLER, Vice-Chairman

Industrial Gas Research and Its Relation to Gas Sales*

By N. T. SELLMAN,
Consolidated Gas Company of New York

N. T. Sellman

THE Fifth Annual Report of the Committee on Industrial Gas Research was published in pamphlet form and distributed to gas company members in June of this year. The exact title of this pamphlet is "Fortifying and Extending the Industrial Use of Gas Through Proper Research and Planning." It describes in considerable detail the twenty-two research activities which have received the Committee's attention. I do not wish to repeat anything that this report so ably covers, and, consequently, I will limit myself to the research developments that have taken place since June of this year. If you are interested in securing a copy of this report, I believe it can be obtained by applying to A. G. A. Headquarters.

Fundamental research, which has a direct bearing on important developments and heat trends in certain key industries, has been carried on by means of eleven projects. Most of these projects have been assigned to universities through fellowships. The information obtained is very valuable and in most cases it has definitely proven that when properly applied gas firing is the ideal fuel. This fundamental research has magnified the importance of temperature control, furnace atmosphere, conditions affecting heat transfer and penetration, and, in some cases, the importance of the time element.

A valuable by-product of our fundamental research has been the presentation of technical papers before trade and engineering societies which contain favorable arguments for gas fuel in varied heat applications. A recent example of this was a paper by Mr. D. W. Murphy, who is associated with the Department of Engineering Research at the University of Michigan, which was presented before the American Society of Steel Treaters at their recent Boston Convention.

Although research in the application of gas heat to forging has been in progress for several years, there is one recent development which has now progressed to the point of commercial application. This is the diffusion flame system of combustion which has been successfully applied to forging and also extended to glass melting. If you are interested in knowing the exact phenomena of diffusion flame combustion, I would refer you to a paper presented by Mr. W. M. Hepburn before this year's Midwest Regional Conference at Chicago.

In the field of bread baking, the most recent development is a semi-portable indirect fired Peel oven which is now ready for commercialization. On preliminary tests and some field trials it develops that this oven is very efficient, safe, and easily controllable. This oven should fill a need in small bakeries, hotels, and restaurants.

Another example of the importance of furnace atmosphere has been brought out in the research of bright annealing of brass and other metals. A practical application employing a methanol atmosphere has produced very satisfactory results with brass. An improved product should also be obtainable by this method on such metals as German silver and silver. The experimental work in developing this method has been completed and the product produced has been highly commended by people in the brass, copper, and alloy industries.

Fundamental research developed that convected heat is the most satisfactory method for baking sand cores. This research definitely showed that convected heat is superior to radiant heat for this purpose. Cores having the maximum strength can be produced in less time and with less heat input when convected heat is used. Consequently, gas should secure its share of this business wherever proper industrial rates prevail.

The relatively high efficiency obtainable by immersion heating was first demonstrated in stereotype melting. Recently, this has been extended to other soft metal melting. This method has produced speed and efficiencies that were not possible with external heating alone.

Research in factors effecting short cycle malleableizing is now actively before the Committee. If certain facts can be established it looks quite hopeful that a successful method of malleableizing, that could be accomplished in a twenty-five hour cycle, will greatly improve the chances of gas being used for this purpose. Present methods call for approximately a one hundred hour cycle, and this new method would consequently represent a material reduction in time. To accomplish this naturally calls for very close control of temperature, timing, and atmosphere.

Three industrial gas problems have been assigned to the A. G. A. Testing Laboratory. They are Research in the Elimination of Noise in Industrial Gas Burners, a Study of the Mixtures of Burning Gas with Preheated Air, and Research in the Fundamentals of Combustion Space Requirements in High-Temperature Gas Furnaces. These three projects are being actively pursued and information which will lead to gas appliances of improved performance is expected.

Careful study of the principles involved appear to have entirely removed a controversial question among gas men and manufacturers. This is the heretofore unsettled question as to the quality of product produced in direct firing of sheet steel enamelling and ceramic ware. In research on direct firing of high grade enamel ware, Professor Brown, of Rutgers, says:

"It is entirely feasible to fire the Lenox ware on a commercial scale in a direct gas fired furnace. The most important factor being the establishment of a satisfactory firing schedule as regards time and temperature.

"The defects resulting from dust particles, blisters, etc. in the direct firing of ware in gas fired furnaces would be no greater than those encountered in indirect firing.

"In our laboratory tests no difficulties such as scumming, etc. due to the action of the furnace gases on the white glazes were observed.

"The blue bordered glazed ware offered no particular problem in our direct firing tests."

As a consequence of this favorable report steps are now being taken to install a direct firing tunnel kiln at the Lenox Plant for the purpose of firing the very highest grade of china ware made in the United States. Other research corroborating these results also indicate that we are now ready to advocate the firing of sheet steel enamel by direct heat.

No single research activity has created more general interest during the past year than that of house cooling. You are all probably aware that during the year three experimental installations were made in three widely separated sections of the country. Two of these installations were in operation long enough to secure valuable information on this important subject.

The Research Committee, after a thorough investigation, decided that a dehumidifying cooling system using silica-gel was the most promising method which could employ gas fuel as the principle operating medium. Consequently, two dehumidifying units were ordered for installation—one in a home in Pelham, New York, and the other in Chicago, Illinois. These two silica-gel units supply a slightly cooler dehumidified air to the space which is to be conditioned. A circulating fan maintains

* Delivered before Industrial Section, A. G. A. Convention, Atlantic City, N. J., Oct. 14, 1931.

the movement of air through a circuit which includes the conditioned space, the silica-gel unit, and the supply and return ducts. A portion of the moisture laden air returning from the conditioned space is by-passed through a silica-gel dehumidifier and rejoins the main air stream, thus providing a mixture whose moisture content is lower than that of the returned air. The mixture is then propelled through an indirect water cooler which reduces its temperature slightly, and is then distributed by the duct system to the space to be conditioned. A duct equipped with a slide shutter makes it possible to draw in as much or as little outside air as may be found desirable.

The Chicago and Pelham installations, although with identical equipment, showed somewhat different operating characteristics. These differences were brought about by the different rate of air infiltration in the two houses, as well as differences in temperature and humidity. It would appear from observations made during the past summer that the Chicago climate shows a greater need for dehumidification than that in Pelham. This is manifested by the following record of operating time:

The Pelham system was in operation for seventy-nine days; this installation being ready for operation as early as June 25. During this entire seventy-nine day period 325 hours of operation were recorded. The Chicago system was not put into operation until pretty near a month later, having only forty-eight days of operation, and during this period was in use 338 hours. One factor, however, had a material effect in reducing the need for air conditioning in the Pelham installation during the later part of the summer. Approximately August 1, the Pelham house was completely insulated and thereafter there were only four days where the temperature and humidity in the house were such that operation was necessary. In addition to that, local conditions such as shade and exposure have their effect. Computed on a theoretical basis from the period of May 15 to September 15 it would appear that the Pelham system would require 500 hours of operation and the Chicago system 850 hours of operation. Expressed in percentage this would be—Pelham 16.7% of the time—Chicago 28.8%. Continuous operation for more than eighteen hours occurred five times at Pelham and four times at Chicago. High night temperatures accompanied by high moisture condition of the outside air causing extreme humidities necessitated these long periods of operation.

Both houses are equipped with warm air heating plants for winter operation. The conditioning system used the same ducts to distribute air, and though the duct systems were not specifically designed for air conditioning they functioned well enough to maintain uniform temperatures and humidities in the conditioned space.

The house which is not designed to allow the closing off of rooms where conditioned atmosphere is desired must be conditioned throughout. Partial conditioning of a space open to an unconditioned space will result in an influx of unconditioned air to the conditioned space. Conditioning of the entire house volume would seem most desirable even though the waking hours of the occupants are spent in two or three rooms, because one of the greatest benefits enjoyed by the occupants during the past summer was a comfortable bedroom on hot, humid nights. The installation of a conditioning system for bedrooms only would be used so seldom that it would yield a poor return on the investment.

Both the Chicago and Pelham systems were manually operated; the system only being in operation when the occupants felt that greater comfort was desirable. It would appear that if automatic control is attempted, all doors and windows would have to remain constantly closed, as under these circumstances rapid changes of outside conditions from comfortable to uncomfortable would not be immediately felt inside and the system would therefore not operate unnecessarily. It is also believed that there would be a difficulty of habituating people to keeping all doors and windows closed and this would complicate the problem of automatic control. Considerable educational work would be necessary to make people understand that a house could be maintained more comfortably in summer with a conditioning system if windows and doors were kept closed. However, experimentation is necessary to definitely determine whether operating time is more or less with automatic control.

The cost of operation per hour of the respective systems after final adjustments and changes have been made appears below:

Pelham System 8-28-31

Gas	145.5 c.f.	at	$ .60/M =	$.087
Water	36.5 c.f.	at	4.00/M =	.146
Power	1.5 kw.	at	.04/kwh =	.060
Total hourly cost				$.293

Chicago System 9-10-31

Gas	118.8 c.f.	at	$.78/M =	$.092
Water	53.7 c.f.	at	.60/M =	.021
Power	2.39 kw.	at	.037/kwh =	.088
Total hourly cost				$.212

The gas consumption is higher and the power consumption lower in Pelham because the Pelham system treated 25% more air and circulated 80% less, therefore, requiring more gas for reactivation and less power for the circulating fan. The Pelham system's water consumption was reduced to a rate only sufficient to keep the house temperature from climbing. Cheap water in Chicago made this refined regulation relatively unnecessary. As an illustration of how existing unit costs of power, gas, and water effect the cost of operation, the Pelham unit costs are applied to the Chicago consumptions and vice versa. A comparison of total cost appears below:

Pelham System

Gas	145.5 c.f.	at	$.78/M =	$.114
Water	36.5 c.f.	at	.60/M =	.021
Power	1.5 kw.	at	.37/kwh =	.055
Total hourly cost				$.190

Chicago System

Gas	118.8 c.f.	at	$ .60/M =	$.071
Water	52.7 c.f.	at	4.00/M =	.211
Power	2.39 kw.	at	.04/kwh =	.095
Total hourly cost				$.377

You will note that by merely changing the relative rates but maintaining the units of consumption the Pelham system is reduced from 29.3 cents per hour to 19.0 cents per hour, and the Chicago system raised from 21.2 cents per hour to 37.7 cents per hour. Even with Chicago's low water rates it appears most important that water consumption must be either materially reduced or preferably eliminated.

In my opinion the next step is to develop an air cooled silica-gel dehumidifying unit coupled with an air cooled silica-gel water vapor refrigerating unit for the purpose of lowering the temperature of the circulating air. This system would be a good load builder for both gas and electricity and be entirely void of the usual restrictions to which large refrigerating systems are subjected. The water used in the refrigerating portion of the system would be of little consequence.

Even should this development be difficult of accomplishment the prospects for summer air conditioning for domestic residences are still as favorable as they were before the recent installation. The past summer's work has demonstrated that dehumidification with but slight lowering of temperatures is feasible and from the point of view of those who experienced it, it is a desirable adjunct to the home. Improvement of operating characteristics and reduction of installation cost are needed to place summer air conditioning within the reach of the public.

A third installation of different design was made in Dallas, Texas, but was not completed until the end of the past summer so no operating information is available. A brief description of the Dallas system is of interest because it embodies a different application of the silica-gel absorption system. In Dallas where relative humidity of the outside atmosphere is consistently low and the temperature high, the silica-gel system supplied air which had been cooled only. The air is circulated as in the other system, the returning warm air, however, passes through an indirect water vapor cooler and is distributed to the conditioned space. The silica-gel unit in this case employs its absorbent properties for producing a water vapor refrigerating cycle. The water from a condenser is expanded to vapor in the coils of the water vapor cooler. The latent heat of evaporation is supplied from the air passing around the coils. The vapor passes from the cooler to the gel unit where it is absorbed, the action of absorption producing a partial vacuum which induces the motion of the water vapor. The absorbed vapor is revaporized by the heat of steam in the coils imbedded in the gel and proceeds to a condenser, the condensation causing a vacuum which further induces the motion of the water vapor. From the condenser

water travels to the expanding coils. Steam is supplied by a gas fired steam boiler. The condensing water is cooled in an evaporative cooler and reused.

Referring again to furthering the development in this system of air conditioning the next step would be to construct a system which would be a combination of what was installed in the modern climates and that installed in Dallas with the addition that all cooling and condensing be accomplished by circulating air.

The last subject on which I will dwell is that of commercial refrigeration. This subject has been before us for sometime, but I am happy to report that early developments are to be hoped for as there are now no less than four properly equipped concerns interesting themselves in this subject and have units under development. All four concerns appear to have the correct conception of this problem and are striving to produce a system which will operate on a continuous cycle. Here again air cooling would be preferable, but not an absolute necessity. In the communities where water costs one dollar per thousand cubic feet or more the overall cost of operating an air cooled unit with its slightly lower efficiency would still be less than the cost of gas plus water on a water cooled system. Air cooling reverts the expense of water to some additional gas consumption because of lower efficiency, and in most communities the relative rates are such that the overall operating cost would be less, in addition to other advantages that could be claimed for an air cooled system.

This briefly depicts the progress made in Industrial Research during the past four months, and the continuance of these activities to an early conclusion will place excellent load building adjuncts in the hands of our industrial gas men.

Natural Gas Aid to Beauty

NATURAL gas is being used in a new way in some of the leading beauty shops of Oklahoma. A hair-drying machine, which utilizes natural gas, has been installed in several shops. At a recent convention of beauty operators it was found that gas used as a dryer does not injure the hair or scalp. The machine will dry ten heads of hair at one time. A warm light air, just moist enough to prove beneficial, circulates through bell-shaped domes that fit over the head.

A. W. Conover, Hominy, Oklahoma, has been appointed general manager of the Oklahoma and Kansas properties of the Empire Public Service Company, Caney Electric Company, The Southwest Pipe Company, and The Southwest Production Company.

Memory of Heroic Foreman Honored by A. G. A.

American Gas Association

MERITORIOUS SERVICE AWARD

This Certificate is awarded with the

American Gas Association Meritorious Service Medal

Frank E. Steinhardt

an employee of the Consolidated Gas Company of New York, New York, N. Y.

In memory of his meritorious and auspicious bravery in the saving of human life at New York, N. Y. on July thirtieth, nineteen hundred and thirty. This act in which he sacrificed his life, is adjudged by the Association to have been the most meritorious performed in the gas industry during the twelve months period ending June thirtieth, nineteen hundred and thirty-one

Alexander Forward
Managing Director

October 12, 1931.

Clifford E. Paige
President

BECAUSE he sacrificed his life in the rescue of a fellow-workman, the memory of Frank E. Steinhardt, a former foreman at the Hunts Point Plant of the Consolidated Gas Company of New York, was honored at the American Gas Association convention in Atlantic City last month. The posthumous award of the A. G. A. Meritorius Service Medal was made by Clifford E. Paige, president of the Association.

Each year this award is made by the American Gas Association in recognition of the most meritorious deed in the saving of life in the gas industry.

When J. Newell was sent into a producer at Hunts Point by Foreman Steinhardt in July, 1930, the workman was overcome by gas. Steinhardt heard Newell's cries for help, entered the producer and assisted the latter to safety. Steinhardt, a man of large stature, also lost consciousness and efforts to lift him out failed. He was not released until after the producer had been cut apart, and later died at a hospital.

West Virginia Towns Get Natural Gas Service

NATURAL gas mains are being installed at White Sulphur Springs, Lewisburg, and Ronceverte, West Virginia, by the United Fuel Gas Company. Service will be available first at White Sulphur, on or about November 1, according to present plans. These three towns have not had natural gas service heretofore.

Miss Elizabeth Leach has been appointed Home Service Director of the Oklahoma Natural Gas Corporation, Tulsa, Oklahoma.

Purdue Announces Conference on Welding

THE Engineering Extension Department of Purdue University announces its Seventh Annual Conference on Welding to be held at Lafayette, Indiana, December 10-11, 1931. The meeting will consist of lectures, demonstrations, and exhibits. Two hundred and seventy-five representatives from the industries of Indiana and neighboring states were in attendance at the conference last year. Requests for programs and other information should be made to Engineering Extension Department, Purdue University, Lafayette, Indiana.

Publicity and Advertising Section

WILLIAM H. HODGE, Chairman ALLYN B. TUNIS, Secretary HENRY OBERMEYER, Vice-Chairman

Wins Award for Best Utility Advertising

Henry Obermeyer

PUBLIC UTILITY AD-VIEWS has announced the selection of the Consolidated Gas Company of New York as winner of the Socrates' High Award for the best public utility advertising for the year ending October 1, 1931. Special mention is accorded and much credit for this achievement is extended to Henry Obermeyer, manager of the Bureau of Advertising and Display, and vice-chairman of the Publicity and Advertising Section of the American Gas Association.

According to the group of advertising executives judging the work of several hundred utility companies, the supremacy of the Consolidated Gas Company advertising during this period was due to the consistent ideafulness of its publicity. The accompanying opinion cited as especially noteworthy the Consolidated Gas idea of selling appliances by telling how to get the most use out of them; this included planning menus, studying recreational possibilities of home basements equipped with gas heating units and other similar practices. Also commended was the policy of tying up with the news, public personalities, and actors, and the injection of a note of humor into the promotion of prosaic household appliances. Attention was called to the skillful use of small space and the degree of efficiency and effectiveness apparent in the exploitation of direct-mail advertising by the winning company.

In commenting upon the advertising success of his company, Mr. Obermeyer scored the prevalent practice of drastically cutting advertising appropriations and recommended a new method of approach to the problem. "The answer," he says, "or rather the remedy, lies in directing at least some of that energy and effort which formerly went into the study of customer psychology to the needs and activities of the company itself."

Convention Calendar

American Petroleum Institute,
Stevens Hotel,
Chicago, Ill.
November 10 to 12.

Third International Conference on Bituminous Coal
Carnegie Institute of Technology,
Pittsburgh, Pa.
November 16 to 21.

A. G. A. Southwest Regional Gas Sales Conference,
Arlington Hotel,
Hot Springs, Ark.
November 16 and 17.

Utility Association Secretaries,
Milwaukee, Wis.
November 30 and December 1.

Mid-West Gas Association,
Gas Meter Short Course and Conference,
Iowa State College,
Ames, Iowa.
December 8 to 11.

Heating and Ventilating Exposition,
Cleveland Auditorium,
Cleveland, Ohio.
January 25 to 29, 1932.

Missouri Association of Public Utilities,
Excelsior Springs, Mo.
April 28 to 30, 1932.

Canadian Gas Association,
Fort Garry Hotel,
Winnipeg, Manitoba.
June 6 and 7, 1932.

American Gas Association,
Atlantic City, N. J.
October 10 to 14, 1932.

What's Within the Gas Range

An illustrated booklet on the modern gas range—full of unbiased, general information which should bring about a better understanding of gas as a cooking fuel, and an appreciation of the modernity of the range.

Copies of the booklet may be secured in any quantity at the following costs:

10¢ each up to 100
9½¢ each 100 to 500
9¢ each 500 to 1000
8½¢ each 1000 to 2500
8¢ each 2500 and over.

Company name may be imprinted on the back cover for slight additional cost.

American Gas Association
420 Lexington Avenue
New York, N. Y.

Papers and Reports Presented at 1931 Convention Available in Pamphlet Form

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GENERAL	Members	Non-Members
Report of Committee on Education of Gas Company Employees	$ .20	$ .40
Report of Rate Structure Committee	.40	.80
Report of Accident Prevention Committee	.35	.70
Report of Committee on Aids in Aviation	.10	.20
Report of Committee on Allied Trades	.05	.10
ACCOUNTING		
Report of Subcommittee on Coding of Material, Supplies and Merchandise	.15	.30
Report of Subcommittee on Standard Departmental Financial and Cost Statements	.20	.40
Report of Subcommittee on Importance of Operating Department Employee in Promoting Customer Relations	.20	.40
Report of Joint Committee on Merchandise Accounting	.10	.20
A Description of the Stub Plan of Customers' Accounting	.20	.40
Post Card Billing and Customers' Record System	.25	.50
Customers Accounting Plan—Remington Powers	.15	.30
Report of Office Management Group	.15	.30
The Stores Control and Accounting Methods of a Public Utility Company	.30	.60
Customers' Accounting Practice of the Consolidated Gas Company of New York	.40	.80
Post Card Billing on the Underwood Selective Register Machine	.10	.20
COMMERCIAL		
Report of Home Service Committee	.25	.50
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Report of Subcommittee on the Effect of Temperature on Iron Oxide Purification, Humidity Being Held Constant	$ .20	$ .40
Report of Subcommittee on the Valuation of Oils for Gas Making Purposes		
Report of Subcommittee on Analysis and Tests	.15	.30
Report of Subcommittee on Chemical and Scientific Developments in the Carbonization of Coal	.45	.90
Report of Subcommittee on Purification of High Sulphur Gases	.40	.80
Report of Subcommittee on Chemical and Scientific Developments Relating to Distribution of Gas	.10	.20
Report of Subcommittee on Analysis of Liquefied Petroleum Gases by Low-Temperature Fractionation	.25	.50
The Chemical Effect of Gaseous Atmospheres in the Bright Annealing of Metals	.10	.20
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Report of Subcommittee on Producers	.10	.20
Report of Subcommittee on Effect of Washing Coal on Coke Properties and By-Product Yields	.10	.20
Report of Builders' Section	.30	.60
Report of Subcommittee on Coke	.15	.30
Factors Affecting By-Product Ammonia Credits	.10	.20
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General Introduction		
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Report of Subcommittee on Pipe Coatings and Corrosion		
Report of Subcommittee on Unaccounted for Gas	.10	.20
Report of Subcommittee on Meters	.10	.20
Report of Subcommittee on Conversion from Manufactured to Natural Gas	.10	.20
Report of Subcommittee on Pipe Joints	.10	.20
Water Gas Committee		
General Introduction and Report of Subcommittee on Modification of Plant Operation to Accommodate Various Gas Mixtures	.15	.30
Report of Subcommittee on Improved Utilization of Gas Oils	.20	.40
Report of Subcommittee on New Developments and Progress in Water Gas Manufacture	.60	1.20
Miscellaneous		
A. G. A. Studies of Coatings for Pipe Lines	.50	1.00
Providing for Peak Loads	.15	.30
Gas Mixtures—Their Selection, Utilization and Distribution	.10	.20
Gum and Problems Arising from Its Presence in Distributed Gas	.10	.20
Economics of Gas Distribution	.25	.50

■ ■

Address

AMERICAN GAS ASSOCIATION

420 Lexington Avenue, New York, N. Y.

455 Enroll in Industrial Gas Salesmanship Course

This course is designed to develop Sales Technique in gas company personnel responsible for Industrial, Hotel and Restaurant, and Large Volume gas sales generally.

For further information address

INDUSTRIAL SECTION

AMERICAN GAS ASSOCIATION

420 Lexington Avenue

New York, N. Y.

Gas—The Logical Fuel

(Continued from page 502)

my modification of our structures designed to meet future economic conditions. In the final analysis the best interests of the customer and of the company prevail when the selling price of our service makes it possible for the customer to secure its maximum benefits at the minimum total cost. This has always been the viewpoint of the sales-minded executive.

204 Manufacturers Attend Annual Meeting

(Continued from page 495)

In the absence of two of the chairmen of the Safety Ordinance Committees, Carl H. Hoffstetter, chairman of the same committee of the Range Division, rendered a report to all three divisions.

The next annual meeting of the Manufacturers' Section will be held during September, 1932. In the course of the year there will be three separate meetings of the various divisions held for the purpose of discussing problems peculiar to that particular branch of the industry. During the year there is also contemplated the organization of two new divisions within the group activities work of the Association.

Chairmen of the three existing divisions within the Manufacturers' Section are as follows:

Range Division—W. Frank Roberts, chairman, Standard Gas Equipment Corp., Baltimore, Md.; Wendell S. Smith, vice-chairman, A-B Stove Co., Battle Creek, Mich.

Water Heater Division—Hartley G. Walker, chairman, Pittsburgh Water Heater Co., Pittsburgh, Pa.; Leo Friedman, vice-chairman, Cleveland Heater Co., Cleveland, Ohio.

Space Heater Division—George A. Humphrey, chairman, General Gas Light Co., Kalamazoo, Mich.; Frank Adams, vice-chairman, Surface Combustion Corp., Toledo, Ohio.

Committee Chairmen are:

Standards of Practice—Range Division—Stanley Grady, secretary, Roberts & Mander Stove Co., Philadelphia, Pa.

Cross Licensing of Patents—Range Division—P. R. Tappan, president, Tappan Stove Co., Mansfield, Ohio.

Safety Ordinance—Range Division—Carl H. Hoffstetter, general manager, Odin Stove Co., Erie, Pa.

Standards of Practice—Water Heater Division—Scott Fowler, president, Lovekin Water Heater Co., Philadelphia, Pa.

Cross Licensing of Patents—Water Heater Division—Frank W. Shuell, president, EverHot Heater Co., Detroit, Mich.

Standards of Practice—Space Heater Division—Carl E. Froelich, vice-president, Continental Stove Co., Ironton, Ohio.

Cross Licensing of Patents—Space Heater Division—E. C. Adams, president, Adams Bros. Mfg. Co., Pittsburgh, Pa.

Safety Ordinance—Space Heater Division—W. L. Sharpe, president, Ohio Foundry & Mfg. Co., Steubenville, Ohio.

Reports of all of these committees were heard and acted upon, details of which will be covered in the proceedings now in the process of preparation at A. G. A. Headquarters.

A United Industry Is Ready

(Continued from page 485)

achieved what he has done. To them all I feel a deep personal obligation for their many acts of service.

While this has been a year of trials and difficulties, we have every reason to look ahead with confidence because over a period of years, the record of this industry has been one of progress. Last year, Mr. Mullaney cautioned us with respect to short range comparisons, and he is right. To enable you to get the proper perspective, let me state that in the last decade, 1920-1930, the gas industry added over 4,600,000 customers, an increase of 40 per cent; the sales of gas increased 110 per cent; and revenues of the industry increased 61 per cent. Surely, this is no cause for discouragement.

With this recital of progress, with our intimate knowledge of the plans for the future, and with the well manned and disciplined organization of this industry, I feel I can confidently say: A UNITED INDUSTRY IS READY—ready for the added responsibilities, ready for the opportunities for enlarged public service, ready to sell more gas.

Thomas G. Storey, formerly associated with the Cities Service Company in Denver and Toledo and with the Kansas City Gas Company in Kansas City, has joined the business staff of Oklahoma Natural Gas Corporation, Tulsa, as an advisor on house heating problems.

Monthly Summary of Gas Company Statistics

FOR MONTH OF AUGUST, 1931

Issued October, 1931, by the Statistical Department of the American Gas Association
420 Lexington Avenue, New York, N. Y.

PAUL RYAN, Statistician

A DECREASE of seven per cent in gas sales and four per cent in revenues is indicated by the comparative operating reports of manufactured and natural gas utilities for the first eight months of 1931.

However, in considering these comparative data on gas utilities for the eight-month period, it must be borne in mind that these months witnessed a recession in general industrial and economic activity fully as severe as any ever experienced by the trade and industry of this country. During this eight-month period the production of bituminous coal declined more than 17 per cent from the corresponding interval of 1930, the output of crude petroleum dropped eight per cent, pig iron production was down 41 per cent and steel ingot production 36 per cent. During this same period the number of freight cars loaded dropped 18 per cent while the production of automobiles declined by more than 26 per cent.

Despite these adverse influences however, reports from a group of natural gas companies representing more than 85 per cent of the public utility distribution of natural gas indicate sales of nearly 465,000,000,000 cu.ft. for the first eight months of 1931, a decline of only nine per cent from the corresponding period of 1930. The revenues of these companies for the same period aggregated about $193,000,000, compared with $206,000,000 a year ago.

In response to the generally depressed condition of trade and business, natural gas sales for industrial purposes declined by more than 15 per cent, but this was practically offset by the industry's program of expansion into new territory where gas service was not previously available. The consumption of natural gas for the generation of electric power during the first eight months of 1931 continued at a rate about eight per cent above the preceding year, despite the fact that during the same period the production of electric power decreased by nearly five per cent.

Because of the relatively smaller proportion of industrial business, manufactured gas sales were not affected to the same extent by the general decline in economic and business activity. Reports from companies representing over 90 per cent of the manufactured gas industry indicate sales for the first eight months of 1931 of 237,000,000,000 cu.ft., a decrease of approximately two per cent over the corresponding period of 1930.

COMPARATIVE STATISTICS OF 165 MANUFACTURED GAS COMPANIES FOR THE MONTH OF AUGUST, 1931

	Month of August			*Eight Months Ending August 31*		
	1931	*1930*	*Per cent Increase*	*1931*	*1930*	*Per cent Increase*
Customers	9,033,476	9,035,967	0.0	*See August*		
Gas Sales (MCF)	24,112,790	24,733,259	— 2.5	237,148,333	241,669,342	— 1.9
Revenue (Dollars)	26,714,117	27,397,853	— 2.5	252,472,071	257,771,803	— 2.1
Gas Produced and Purchased (MCF)						
Gas Produced						
(a) Water Gas	11,335,121	11,217,507	1.0	115,586,172	119,447,316	— 3.2
(b) Retort Coal Gas	2,401,327	2,421,905	— 0.8	20,811,370	20,697,829	0.5
(c) Oil Gas	478,330	492,693	— 2.9	4,994,782	5,372,812	— 7.0
(d) Coke Oven Gas	4,343,350	3,896,311	11.5	34,566,264	31,966,001	8.1
(e) Reformed Oil Still Gas	343,538	142,160	—	2,882,467	1,149,916	—
(f) Total Gas Produced	18,901,666	18,170,576	4.0	178,841,055	178,633,874	0.1
Gas Purchased						
(a) Coke Oven Gas	7,558,049	8,934,489	—15.4	70,897,512	75,768,177	— 6.4
(b) Oil Still and Natural Gas	407,670	217,824	87.1	3,077,140	2,207,075	39.4
(c) Total Gas Purchased	7,965,719	9,152,313	—13.0	73,974,652	77,975,252	— 5.1
Total Gas Produced and Purchased	26,867,385	27,322,889	— 1.7	252,815,707	256,609,126	— 1.5

COMPARATIVE STATISTICS OF 163 NATURAL GAS COMPANIES FOR THE MONTH OF AUGUST, 1931

Customers						
Domestic (Including House Heating)	4,326,710	4,274,244	1.2			
Commercial	195,783	185,264	5.7			
Industrial	15,031	15,102	— 0.5	*See August*		
Main Line Industrial	5,126	4,877	5.1			
Miscellaneous	1,650	2,824	—			
Total	4,544,300	4,482,311	1.4			
Gas Sales (MCF)						
Domestic (Including House Heating)	10,631,623	10,872,312	— 2.2	196,383,660	200,404,447	— 2.0
Commercial	1,641,285	1,653,583	— 0.8	28,972,455	27,011,721	7.3
Industrial	16,356,086	18,770,558	—12.9	133,191,778	155,651,078	—14.4
Main Line Industrial	13,232,208	14,915,436	—11.3	101,655,713	122,121,268	—16.8
Miscellaneous	498,832	592,570	—	4,692,907	5,895,224	—
Total	42,360,034	46,804,459	— 9.5	464,896,513	511,083,738	— 9.0
Revenue (Dollars)						
Domestic (Including House Heating)	8,651,752	8,830,601	— 2.0	134,102,732	136,616,053	— 1.8
Commercial	915,011	947,120	— 3.4	14,288,937	13,961,445	2.3
Industrial	3,493,678	4,267,552	—18.1	30,703,871	37,923,792	—19.0
Main Line Industrial	1,534,871	1,967,900	—22.0	13,148,958	15,737,036	—16.4
Miscellaneous	61,886	115,040	—	676,804	1,270,198	—
Total	14,657,198	16,128,213	— 9.1	192,921,302	205,508,524	— 6.1

Associations Affiliated with A. G. A.

Canadian Gas Association
Pres.—Hugh McNair, Winnipeg Electric Co., Winnipeg, Man.
Sec.-Tr.—G. W. Allen, 21 Astley Avenue, Toronto.

Empire State Gas and Electric Association
Pres.—Alfred H. Schoellkopf, Niagara Hudson Power Co., Buffalo, N. Y.
Chairman Gas Section—M. F. Clement, Rockland Light & Power Co., Middletown, Ind.
Sec.—C. H. B. Chapin, Grand Central Terminal, New York, N. Y.

Illinois Gas Association
Pres.—H. A. Kleinman, Peoples Power Co., Moline, Ill.
Sec.-Tr.—George Schwaner, 617 Public Service Bldg., Springfield, Ill.

Indiana Gas Association
Pres.—F. X. Mettenet, Indiana Electric Co., Indianapolis, Ind.
Sec.-Tr.—P. A. McLeod, Northern Indiana Power Co., Huntington, Ind.

Michigan Gas Association
Pres.—J. E. Spindle, Grand Rapids Gas Light Co., Grand Rapids, Mich.
Sec.-Tr.—A. G. Schroeder, Grand Rapids Gas Light Co., Grand Rapids, Mich.

Maryland Utilities Association
Pres.—Adrian Hughes, Jr. Baltimore, Md.
Sec.—D. E. Kinnear, 803 Court Square Bldg., Baltimore, Md.

Mid-West Gas Association
Pres.—John K. Swanson, Minneapolis Gas Light Co., Minneapolis, Minn.
Sec.-Tr.—Roy B. Searing, Sioux City Gas & Electric Co., Sioux City, Iowa.

Missouri Association of Public Utilities
Pres.—A. E. Bettis, Kansas City Power and Light Co., Kansas City, Mo.
Sec.-Tr.—F. D. Beardslee, 315 N. 12th St., St. Louis, Mo.
Asst. Sec.—Jesse Blythe, 103 West High St., Jefferson City, Mo.

New England Gas Association
Pres.—M. B. Webber, Arlington Gas Light Co., Arlington, Mass.
Exec. Sec.—C. D. Williams, 41 Mount Vernon St., Boston, Mass.
Chairman Operating Div.—F. M. Goodwin, Boston Consolidated Gas Co., Boston, Mass.
Sec. Operating Div.—P. R. Buchanan, Hartford Gas Company, Hartford, Conn.
Chairman Sales Div.—J. J. McKearin, Lowell Gas Light Co., Lowell, Mass.
Sec.-Tr. Sales Div.—Robert D. Stuart, Jr., Fall River Gas Works Co., Fall River, Mass.
Chairman Industrial Div.—Chas. H. O'Donnell, Boston Consolidated Gas Co., Boston, Mass.
Sec.-Tr. Industrial Div.—Phillip A. Nelles, Jr., C. H. Tenney Co., Boston, Mass.
Chairman Acctg. Div.—C. N. Alexander, C. H. Tenney & Co., Boston, Mass.
Sec.-Tr. Acctg. Div.—Otto Price, Boston, Mass.
Chairman Manufacturer Div.—A. M. Slattery, The Hoffman Heater Co., Boston, Mass.
Sec.-Tr. Manufacturers Div.—J. H. McPherson, Clow Gasteam Heating Co., Boston, Mass.

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Sec.-Tr.—H. E. Cliff, Public Service Electric & Gas Co., Newark, N. J.

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Sec.-Tr.—Wm. H. Thompson, 811 First National Bank Bldg., Columbus, Ohio.

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Pacific Coast Gas Association
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Mang. Dir.—Clifford Johnstone, 447 Sutter St., San Francisco, Calif.

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Pres.—H. Smyser Bair, Pennsylvania Gas & Electric Co., York, Pa.
Sec.-Tr.—Frank W. Lesley, Pennsylvania Gas & Electric Co., York, Pa.

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Sec.-Tr.—B. H. Smyers, Jr., 435 Sixth Ave., Pittsburgh, Pa.

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Pres.—Edward N. Avegno, New Orleans Public Service, Inc., New Orleans, La.

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Pres.—Knox Lee, Southwestern Gas & Electric Co., Marshall, Texas.
Sec.—E. N. Willis, 530 13th Street, SE., Brownsville, Texas.

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Pres.—T. Justin Moore, Va. Elec. & Power Co., Richmond, Va.

Wisconsin Utilities Association
Pres.—A. J. Goedjen, Wisconsin Public Service Corp., Green Bay, Wis.
Exec.-Sec.—J. N. Cadby, 135 West Wells St., Milwaukee, Wis.

Fourteenth Annual Convention of the American Gas Association
Atlantic City, N. J. - - - October 10-14, 1931

Personnel Service

SERVICES OFFERED

Manufacturers' representative in the Chicago district desires an additional non-conflicting line. Thoroughly established. Prefers foundry, furnace or heating equipment. **456.**

Staff accountant, experienced in cost and rate analyses, preparation of rate schedules, statistics and special accounting and economic studies of utility operation, desires position in similar work. Twelve years' experience. Age 32, single. No objection to travelling or location. **458.**

Utility sales manager with a number of years' experience with gas companies in the East and Mid-West would like to connect with a manufacturer of high-grade gas appliances with a view to introducing the product among utilities, where he has an extensive acquaintance and thorough knowledge of the business. **459.**

Manager, with well rounded experience, both practical and technical, covering economical operation, high- and low-pressure distribution, construction, public relations, rate structure and sales. Have built up several run down properties. Desire position as manager or assistant to executive. **461.**

University man with exceptional practical and technical training and long experience in heavy **industrial** uses of gas (any source) industrial relations, and in the various phases of **sales** work, seeks responsible position with large utility, a wholesaler of gas to utilities, combustion engineering concern, or manufacturer. In close touch with latest flaming methods. Thoroughly competent in sales or development work. Employed. Arrange for interview. **462.**

Graduate **engineer**—experienced in design, construction and operation of transmission lines, medium- and low-pressure distribution plants, in both manufactured and natural gas; desires position with operating or engineering company. **464.**

Gas engineer, M. I. T. graduate (32) ten years' practical experience as superintendent of plant with coal and water gas, distribution high- and low-pressure, construction and operation of new gas equipment. Desire position as manager or superintendent of plant or distribution. **466.**

Engineer (31) eight years' varied experience with a large utility. College graduate; single; location immaterial. Utility or sales position desired. **468.**

Manager, at present employed, desires to connect with a substantial and established natural gas company. Have had exceptional experience in operating group properties, manufactured and natural gas and electric. Am an economical and conservative operator and can produce new business. **469.**

Connection desired as **sales director** or Eastern **sales manager** with progressive gas appliance manufacturer. If you have an approved and suitably priced article of real commercial merit, I can establish the market. I offer you extensive contacts within the public utility industry plus experience in every important phase of the sales promotional field. **470.**

Engineer, experienced in development of natural gas project from production to sales. Can block acreage, purchase or drill for gas, determine potential market, design and construct pipe line, negotiate sales of gas. Desires opportunity and backing from parties able to carry through a utility investment plan. **471.**

Salesman (35), six years' experience retailing domestic gas appliances for public utility desires position with gas company or manufacturer, would prefer to specialize on sale of automatic water heaters or ranges. Will go anywhere. Married. **472.**

Advertiser with twenty-four years' experience as solicitor, commercial agent and **manager** of five small gas companies is available for any position commensurate with ability. Experience includes manufacture coal and water gas, high- and low-pressure distribution, sales campaigns and office detail. Age 43, and married. **473.**

Industrial sales engineer, experienced in all branches of industrial furnace application, including surveys, sales and competitive fuel situations, as well as furnace operation; wide experience in both natural and manufactured gas installations; thorough understanding of general sales policies and methods of procedure. Eastern location preferred. **474.**

Gas range **salesman** with broad experience and wide acquaintance among utility, department store and furniture trade in the middle western states desires new connection. Have a clean record and can furnish references. Prefer middle western territory, but will go anywhere. **476.**

A chemical engineer (research) B.S. chemical engineering with five years' experience in the gas industry, including two years' research work, desires a position in a laboratory or plant as a **chemist** or **chemical engineer** with an opportunity at research work. Salary arranged. **477.**

Anti-depression Sale! Must sell my services. Columbia **chemical engineer**—six year graduate. Sound training, learns quickly, thinks clearly. Long experience includes analytical chemistry; research and development in field of coal carbonization and gasification; industrial temperature, pressure, and fluid flow measurements and instruments. Age 31, healthy, married, Christian. **478.**

Managing executive, possessing well-rounded practical and technical experience covering all departments of gas industry, having advanced to General Manager, and knows the details, wishes a position where this knowledge can be usefui in any capacity. High grade, enthusiastic, resourceful worker with initiative to accept responsibilities. **479.**

Graduate **mechanical engineer** thoroughly experienced in the sale, design and service of domestic heating plants of all kinds desires sales or engineering position in house heating division of gas company. **480.**

Industrial and **house heating engineer** (31) with over eight years' experience in all phases of industrial gas and house heating sales, utilization. Desires new connection with gas company or equipment manufacturer. **481.**

Engineer, research, design and production of gas-burning equipment, both domestic and industrial. Have recently developed and control an atmospheric gas burner and pilot. Low manufacturing cost, flexible and efficient. **482.**

Manager, with record in both gas and electric industry in load building, merchandising and public relations work wishes connection, where his ability to direct and increase sales may be demonstrated. Experience embraces construction, development and operations of both gas and electric properties including butane gas. Willing to locate anywhere and can produce results. **483.**

Industrial sales engineer (45) now employed by one of the largest gas companies in the country. Competent to make surveys of industrial plants heating equipment and make necessary recommendations for conversion to gas. Thoroughly acquainted with the application of butane gas and its installation. Experienced in directing a sales force. **484.**

Engineer, eight years' broad experience in public utility work, both gas and electric covering management, valuation, cost analysis, construction estimates, operating improvements, marketing studies, rates, etc. Age 38. Married. **485.**

Efficiency engineer, sales minded, twelve years as executive in field work and supervision of accounting and sales; six as treasurer. Thoroughly conversant with utility accounting system and public service commission regulations. Capable of undertaking standardization of forms and printing. Now employed in a responsible position by one of the most highly respected utility and engineering corporations. (42) Married. **486.**

Distribution or sales, several years' experience. Fine record handling construction and labor. Five years foreman of coal gas plant; can show results. Would like small or medium size property. **487.**

Gas Engineer (B.S.) offers the following unique experiences: **(1)** design and construction engineering for three complete plants from ground up; **(2)** design of definite detailed plants for taking care of present and future low-pressure areas in high- and low-pressure distribution systems; **(3)** education and training of employees for the starting up and operation of the largest water gas plants in Middle West. Active and aggressive. **488.**

POSITIONS OPEN

Gas range superintendent wanted for modern Eastern gas range plant. Must be capable of taking complete charge of production and enameling. Good opportunity for thoroughly experienced executive. State qualifications fully. Information will be held strictly confidential. **0223.**

Industrial gas sales engineer to conduct research on industrial gas applications and aggressively canvass for New Business. Location—New York State. Technical graduate preferred, with experience in Industrial Department of Gas Company. Age—preferably 30-35. State age, experience in detail and salary expected. **0224.**

Sales engineer to represent manufacturer of industrial gas combustion equipment in New England territory. Someone living in territory with knowledge of industrial gas application and willing to work in exclusive territory on straight commission basis. **0225.**

A very desirable connection is available to a young and energetic **engineer** with executive ability as Vice-President in charge of operations of a public utility corporation supplying natural gas to domestic and industrial consumers; must be capable of designing and installing high- and low-pressure systems and general management. To qualify as company executive requires a nominal investment. Give full details in first letter as to age, references and salary expected. All replies held in strictest confidence. **0226.**

Secretary—male stenographer with some knowledge of accounting and utility methods to work with manager of gas and electric company. Good opportunity for right man. **0227.**

Research chemist by well-established company manufacturing special protective coatings for underground and under water steel structures. Products are usually of bituminous base, but while some knowledge of such products is desirable, a more important requirement is a wide knowledge of materials in general. He will have two or three assistants. Company is a leader in its field and there is a good future for the right man. Salary commensurate with ability and results. Location vicinity of New York. Give full particulars and salary expected. **0228.**

Sales director to conduct educational work among salesmen consisting of lectures, class room work and field assistance with individuals to improve sales technique in presenting product and in closing the sale. **0229.**

Oil gas plant **foreman** with operation and maintenance experience with the Jones two shell set. **0230.**

Large Eastern public utility company requires the services of a University Graduate in Business Administration as **Assistant Supervisor of Auditing Department.** Successful applicant must be not less than 25 years of age and have had at least five years practical experience in large corporation advanced accounting, including supervisory duties. Give age, education, experience, references and salary desired. **0231.**

AVAILABLE PERSONNEL

If you do not see the man you want listed on this page we may have the personnel you are seeking in our file of confidential classification records. They are at your service.

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AMERICAN GAS ASSOCIATION, INC.

HEADQUARTERS, 420 LEXINGTON AVE., NEW YORK, N. Y.

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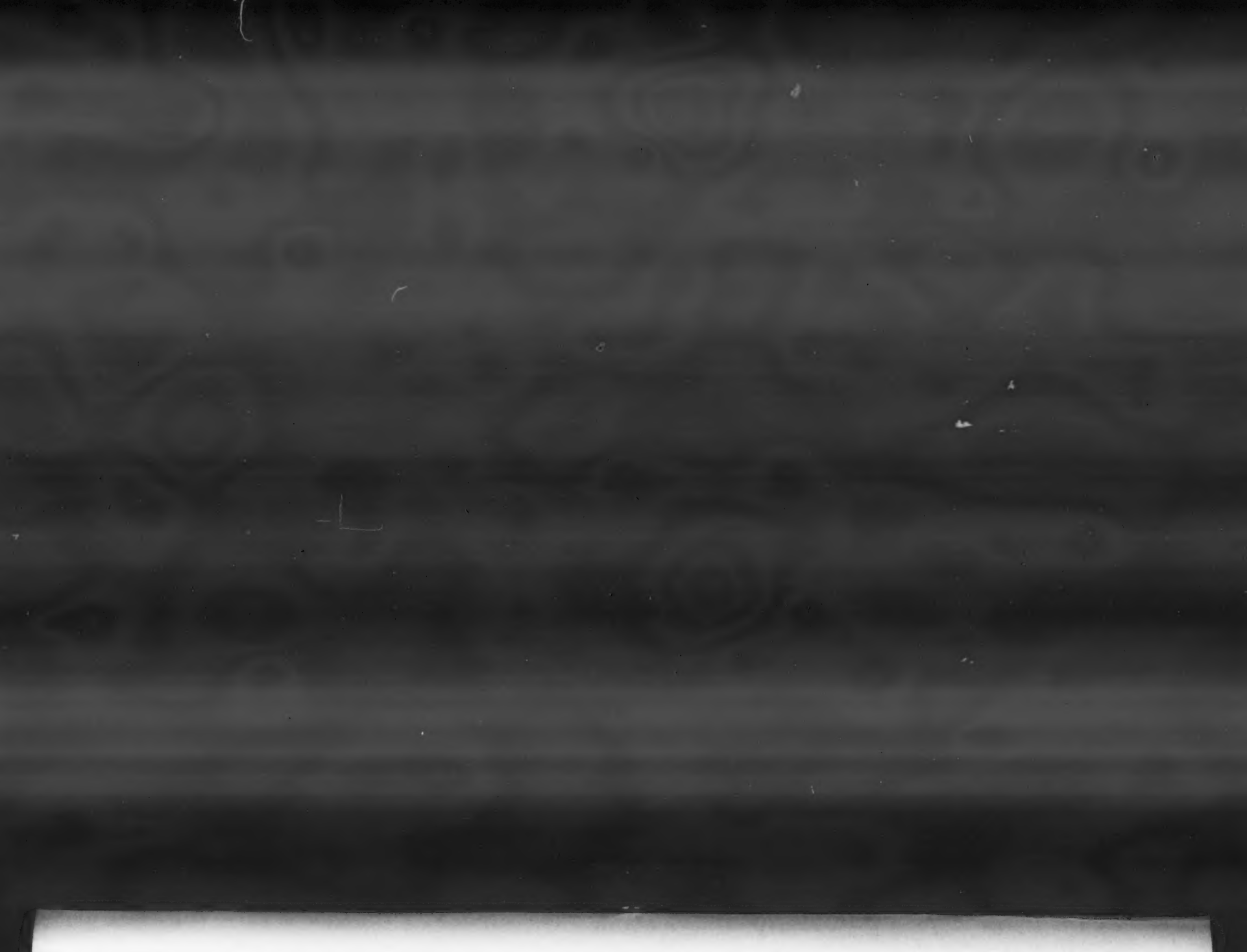
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